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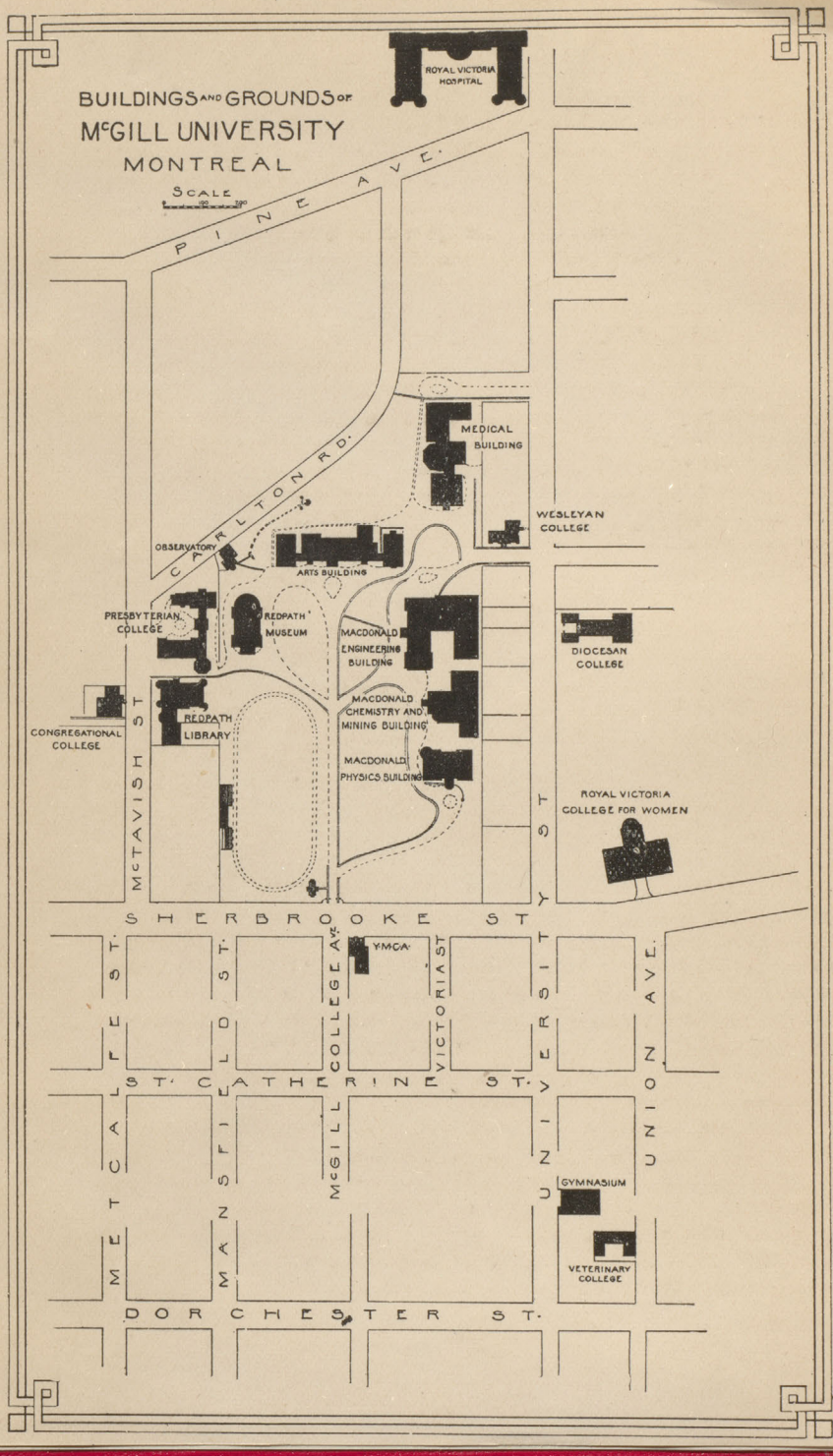
BUILDINGS AND GROUNDS OF
McGILL UNIVERSITY
MONTREAL
SCALE
ROYAL VICTORIA HOSPITAL
PINE AVE.
CARLTON RD.
MEDICAL BUILDING
WESLEYAN COLLEGE
OBSERVATORY
ARTS BUILDING
PRESBYTERIAN COLLEGE
REDPATH MUSEUM
MACDONALD ENGINEERING BUILDING
DIOCESAN COLLEGE
CONGREGATIONAL COLLEGE
REDPATH LIBRARY
MACDONALD CHEMISTRY AND MINING BUILDING
MACDONALD PHYSICS BUILDING
ROYAL VICTORIA COLLEGE FOR WOMEN
McTAVISH ST
UNIVERSITY ST
SHERBROOKE ST
Y.M.C.A.
PEEL ST.
METCALFE ST.
MANSFIELD ST.
COLLEGE AVE.
McGILL
VICTORIA ST
UNIVERSITY
UNION AVE.
ST. CATHERINE ST.
GYMNASIUM
VETERINARY COLLEGE
DORCHESTER ST.

McGill University.

FOUNDATION AND EARLY HISTORY.

Almost alone in this respect among Canadian colleges and universities, McGill University owes its origin to a private endowment. Its founder, the Hon. James McGill, from whom the University takes its name, was born on the 6th October, 1744, in Glasgow, Scotland, where he received his early education and training. Emigrating to Canada before the American Revolution, he engaged in the North-West fur trade, then one of the leading branches of business in Canada. Subsequently he settled in Montreal, and, in partnership with his brother, Andrew McGill, became one of its leading merchants, distinguished for his public spirit and his exertions for the advancement of the city. He was lieutenant-colonel and subsequently colonel of the Montreal City Militia; and, in his old age, on the breaking out of the American war of 1812, he became brigadier-general, and was prepared to take the field in defence of his country. He also represented the West Ward of Montreal in the Provincial Legislature, and was afterwards a member of the Legislative and Executive Councils. Cultivating and enjoying the society of the few men of learning then in the colony, he took a special interest in the establishment of an educational system in the Province of Quebec. By his will, bearing date the 8th January, 1811, more than two years before his death, which happened on the 19th December, 1813, he bequeathed his property of Burnside and a sum of £10,000 in money, to found a college in a provincial university, the erection of which had already been provided for by the generosity of the British Government. Three leading citizens of Montreal were appointed trustees under the will, and were directed to convey the subject property of the bequest to the Royal Institution for the Advancement of Learning, a body which, in 1802, had been incorporated by the Legislature "for the establishment of Free Schools and the advancement of Learning" in the Province of Quebec. The conditions upon which the property was to be transferred to the Royal Institution for the Advancement of Learning were, mainly, that that Institution should, within ten years after the testator's decease, erect and establish on his Burnside estate "an University or College, for the purposes of education and the advancement of

learning in this Province," and that the college, or one of the colleges, in the University, if established, should "be named and perpetually be known and distinguished by the appellation of McGill College." Owing to persistent opposition by the leaders of one section of the people to any system of governmental education and to the refusal by the Legislature to make the grants of land and money which had been promised, the proposed establishment of the provincial university by the British Government was abandoned.

In so far as the McGill College was concerned, however, the Royal Institution at once took action by applying for a Royal Charter. Such a charter was granted in 1821, and the Royal Institution prepared to take possession of the estate. But, owing to protracted litigation, this was not surrendered to them till 1829. Commencing then the work of teaching with two faculties, Arts and Medicine, the record of the first thirty years of the University's existence is an unbroken tale of financial embarrassment and administrative difficulties. The charter was cumbrous and unwieldy, and unsuited to a small college in the circumstances of this country, and the University, with the exception of its medical faculty, became almost extinct. But after thirty years the citizens of Montreal awoke to the value of the institution which was struggling in its midst. Several gentlemen undertook the responsibility of its renovation, and, in 1852, an amended charter was secured. The Governor-General of Canada for the time being, Sir Edmund Head, became interested in its fortunes, and in 1855, with the advent of a new Principal, an era of progress and prosperity began.

CONSTITUTION.

By the amended Charter "the Governors, Principal, and Fellows" of the University are constituted a body politic and corporate, with all the usual rights and privileges of corporate bodies. The supreme authority of the University, however, is vested in the Crown, and is exercised by His Excellency the Governor-General of Canada for the time being. This is a special and important feature of the constitution, for, while it gives the University an imperial character and removes it at once from any merely local or party influence, it secures the patronage of the head of the political system of the country.

The Governors of the University are the members of the Royal Institution for the Advancement of Learning, already mentioned, and in them are vested the management of finances, the passing of University statutes and ordinances, the appointment of professors, and other important duties. Their number is limited to fifteen, and vacancies are filled by the nomination of the remaining members, with the approval of the Visitor. The President of the Board of Governors is, *ex-officio*, Chancellor of the University.

The Principal is the academic head and chief administrative officer. He is appointed by the Board of Governors, and is, *ex-officio*, Vice-Chancellor of the University.

The Fellows are limited to 43 in number, and are selected with reference to the representation of all the Faculties and departments of the University, of affiliated colleges and of other bodies.

The Governors, Principal, and Fellows, together constitute the Corporation, the highest academical body. Its powers are fixed by statute, and include the framing of all regulations touching courses of study, matriculation and graduation, and the granting of degrees.

The Principal, the Deans of the several Faculties, the Professors and Associate Professors, and other members, not exceeding ten in number, of the teaching staff, constitute the Academic Board of the University, with the duty of considering such matters as pertain to the interests of the University as a whole, and of making recommendations concerning the same.

The Statutes and Regulations of the University have been framed on the most liberal principles, with the view to affording to all classes of persons the greatest possible facilities for the attainment of mental culture and professional training. In its religious character the University is Protestant, but not denominational, and while all possible attention is given to the character and conduct of students, no interference with their individual views is sanctioned.

FACULTIES AND COURSES.

The educational work of the University is carried on in McGill College, the Royal Victoria College for Women, and other University buildings in Montreal, and in affiliated colleges:

The Faculties are five in number:

The Faculty of Arts.—The undergraduate courses of study extend over four sessions of eight months each. In the third and fourth years extensive options are provided, and certain exemptions also are allowed to professional students. The courses of study lead to the Degrees of B.A., M.A., B.Sc., M.Sc., D.Sc., and D.Litt. The Degree of B.A. from this University admits the holder to the study of the learned professions without preliminary examination, in the Provinces of Canada and in Great Britain and Ireland, and elsewhere.

The undergraduate course in Arts can be taken along with the undergraduate course in Medicine or Applied Science in six years, or with the undergraduate course in Law in five years. This is effected by avoiding the duplication of courses in the same subjects or in those which give the same educational training, and by a proper adaptation

of the time tables. Alternatively, a certificate of Literate in Arts is given along with the Degree in Medicine, Applied Science, or Law, to candidates who have completed two years in Arts before entering the Professional Faculty.

The curriculum in Arts provides for the education of women, mainly in separate classes, with courses of study, exemptions, degrees and honours identical with those for men.

The Faculty of Applied Science.—The undergraduate courses of study extend over four years of eight months each, and provide a thorough professional training in Civil Engineering, Mechanical Engineering, Mining Engineering and Assaying, Electrical Engineering, Practical Chemistry and Architecture. The courses of study lead to the Degrees of B.Sc., M.Sc., and D.Sc. The undergraduate course in Arts can be taken along with the undergraduate course in Applied Science in six years.

The Faculty of Law—The undergraduate course extends over three Sessions of eight months each, and leads to the Degrees of B.C.L. and D.C.L. The undergraduate course in Arts can be taken with the undergraduate course in Law in five years.

The Faculty of Medicine.—The undergraduate course of study extends over four Sessions of nine months each, and leads to the Degree of M.D., C.M. The undergraduate course in Arts can be taken along with the undergraduate course in Medicine in six years.

The Faculty of Comparative Medicine and Veterinary Science.—The undergraduate course of study extends over three Sessions of six months each, and leads to the Degree of D.V.S.

AFFILIATED COLLEGES.

Students of Affiliated Colleges are matriculated in the University, and may pursue their course of study in the Affiliated College, or in part in the Affiliated College, and in part in McGill College, as the case may be, and may come up to the University Examinations on the same terms as the students of McGill College.

THE STANSTEAD WESLEYAN COLLEGE, STANSTEAD, P.Q.—Is affiliated in so far as regards the work of the first two years and the Intermediate examination in Arts. [Detailed information may be obtained from the REV C. R. FLANDERS, B.A., D.D., Principal.]

VANCOUVER COLLEGE, VANCOUVER, B.C.—Is affiliated in so far as regards the work of the First Year in Arts. [Detailed information may be obtained from J. C. SHAW, ESQ., M.A., Principal.]

AFFILIATED THEOLOGICAL COLLEGES.

Students of the following Affiliated Theological Colleges may attend the courses of study in Arts, either as undergraduates or partial students, with such facilities in regard to exemptions as may be agreed on:

THE CONGREGATIONAL COLLEGE OF CANADA, MONTREAL. Principal, REV. J. HENRY GEORGE, D.D., Ph.D., 58 McTavish St.

THE PRESBYTERIAN COLLEGE, MONTREAL, in connection with the Presbyterian Church in Canada. Principal, REV. D. H. MACVICAR, D.D., LL.D., 69 McTavish St.

THE WESLEYAN COLLEGE OF MONTREAL. Principal, Rev. J. T. L. Maggs, B.A., B.D.

THE DIOCESAN COLLEGE OF MONTREAL. Principal, REV. HENRY M. HACKETT, M.A., B.D., 201 University St.

Calendars of the above Colleges and all necessary information may be obtained on application to their Principals.

McGILL NORMAL SCHOOL.

THE McGILL NORMAL SCHOOL provides the training requisite for Teachers of Elementary and Model Schools and Academies. Teachers trained in this School are entitled to Provincial Diplomas, and may, on conditions stated on p. 287, enter the classes in the Faculty of Arts for Academy Diplomas and for the Degree of B.A. Principal, S. P. ROBINS, LL.D., 32 Belmont St., Montreal, from whom copies of the School announcement may be obtained.

AFFILIATED HIGH SCHOOLS, ETC.

The following schools are affiliated in the sense of preparing candidates for matriculation:

The Trafalgar Institute for the higher education of women, Simpson St., Montreal, Principal, Miss Grace Fairley. The High School of Montreal, and the Girls' High School of Montreal, Metcalfe St., Principal, Rev. Elson I. Rexford, B.A.

Schools which have prepared successful candidates for the University ***School*** *Examinations or for matriculation (June, 1899):*

High School, Montreal; Girls' High School, Montreal; Abingdon School, Montreal; Montreal Coll. Inst.; Miss Symmers' and Miss Smith's School, Montreal; Westmount Acad.; Bishop's Coll. School, Lennoxville; Compton Ladies' Coll.; Cookshire Acad.; Danville Acad.; Dufferin Gram. School; Feller Inst.; Gault Inst.; Valleyfield; Granby Acad.; Guelph Coll. Inst.; Harrison Coll.; Huntingdon Acad.; Inverness Acad.; College of Regiopolis,

Kingston; Knowlton Acad.; Lachute Acad.; Lennoxville Mod. School; Magog Mod. School; Mansonville Mod. School; Merchiston Castle School, Edin.; New Westminster H. S.; Ormstown Acad.; Ottawa Coll. Inst.; Paspebiac Mod. School; Pembroke H. S.; Boys' H. S., Quebec; Renfrew H. S.; Ridley Coll., St. Catharines; Church School for Boys, Rothesay, N.B.; Rothesay School for Girls, St. John, N.B.; Sherbrooke Acad.; Stanstead Wesleyan Coll.; Sutton Acad.; St. Albans School, Berthier; St. Bonaventure Coll., St. John's, Nfld.; St. Louis Coll., New Westminster, B.C.; St. Francis Coll. School; High School, St. John, N.B.; St. John's H. S.; Upper Canada Coll.; Vancouver Coll.; Vancouver, B.C.; Coll. School, Victoria, B.C.; Waterloo Acad.; Williamstown H. S.

AFFILIATION TO OXFORD, CAMBRIDGE, AND DUBLIN UNIVERSITIES.

The University is affiliated to the Universities of Oxford, Cambridge, and Dublin, under conditions which allow an undergraduate who has taken two years work, and passed the University Intermediate Examination in Arts to pursue his studies and take his Degree at either of those universities on a reduced period of residence.

THE SESSION.

The University Year or Session varies for the several Faculties: For 1900-1901:—

The Session of the Faculty of **Arts** commences on 17th September, 1900, and ends on 30th April, 1901. Summer classes in English, Latin, Greek, Mathematics, French, German, and Logic will be held 1900, and ends on 30th April, 1902.

The Session of the Faculty of **Applied Science** commences on 17th September, 1900, and extends to 30th April, 1901. Field work in Surveying commences on 1st September, 1900. The Summer School in Mining commences at the end of the Session, and continues to about the end of the second week in June.

The Session of the Faculty of **Law** commences on 4th September, and ends on 30th April, 1901.

The Session of the Faculty **of Medicine** commences on 17th September, 1900, and ends on 15th June, 1901.

The Session of the Faculty of **Comparative Medicine** and Veterinary Science commences on 22nd September, 1900, and ends on 29th March, 1901.

The Session is divided into two terms, the first extending to the Christmas vacation, and the second from the expiry of the Christmas vacation to the date appointed for the meeting of Convocation for the conferring of degrees.

BOARD AND RESIDENCE.

No residential accommodation has as yet been provided in the College for men students. Women students may board and reside either in private houses or in the Royal Victoria College, which provides, in addition to separate lecture rooms, residential accommodation for the women students of the University.

Good board and lodgings can be obtained in private houses in the vicinity of the University buildings at a cost of from $15 to $25 per month; or, separately, board at $12 to $15 per month, rooms at $4 to $10 per month.

A list of suitable boarding and Lodging houses, the sanitary conditions of which are required to be properly certified, is prepared annually, and may be obtained upon application to the Registrar of the University or the Janitor of the Medical building.

Full particulars of the Royal Victoria College for Women and the terms of residence therein are given on pp. 118-122.

The erection of suitable University residential halls for men is contemplated in the near future.

The McGill Y.M.C.A. will arrange to meet any stranger at the station, and aid him to secure lodgings, etc., if sufficient notice of time of arrival and station is sent to the secretary of the McGill Y.M.C.A., 844 Sherbrooke Street, Montreal.

TRAVELLING EXPENSES.

Students presenting a certificate which may be obtained from the University Registrar or the Registrar of the Faculty of Medicine can procure return tickets from Montreal to any other place in Canada at greatly reduced rates, good from the close of one session to the beginning of the next, or for the Christmas vacation.

EXHIBITIONS, SCHOLARSHIPS, PRIZES, ETC.

Bursaries, Exhibitions and Scholarships, particulars of which are given in the announcements of the several Faculties (see *post*), are offered for competition to students entering the University. In addition to a number of valuable exhibitions and scholarships offered for competition to Second and Third Year students,

Twenty-one First Year Entrance Exhibitions,

ranging from $90 to $200 each, will be offered for competition to students entering the First Year in Arts in September,

1900. For details of the examination, which may serve also as an examination for matriculation, see pp. 39-42.

Gold Medals, Honours, and Prizes are awarded for advanced courses of study.

CLASSIFICATION OF STUDENTS.

Except under special circumstances, no student under the age of sixteen is admitted to the First Year courses, or under the age of seventeen to the Second Year courses in Arts, Applied Science or Medicine, and no student under the age of seventeen is admitted to the courses in Law or Comparative Medicine and Veterinary Science.

Students are classified as Graduate Students (see p. 22) Undergraduates, Conditioned Students and Partial Students.

Undergraduates are matriculated students who are pursuing a full undergraduate course of study leading to a degree.

Conditioned Students are those who, not having completed their matriculation examination, are pursuing a full undergraduate course of study leading to a degree, and are entitled, under the regulations of the Faculty, to obtain undergraduate standing, upon completing their matriculation; credit being given for their work as Conditioned Students.

Partial Students are those who, not belonging to one of the above classes of students, are pursuing a course of study in the University.

Women are admitted to the courses in Arts (on identical terms with men, but mainly in separate classes), and also to the Architectural, Freehand Drawing and Modelling Classes in the Faculty of Applied Science.

All students are required to attend lectures at the University buildings in Montreal, or at one of the affiliated colleges.

UNDERGRADUATES.

In order to obtain undergraduate standing, a candidate must have passed the Matriculation Examination of the University, or some other examination accepted in lieu thereof

(see p. 16), and have registered as a Matriculated Undergraduate.

CONDITIONED STUDENTS.

Candidates who fail to pass the September Matriculation Examination may, if so recommended by the Board of Matriculation Examiners, enter the First Year Undergraduate Course as Conditioned Students with the view of subsequently obtaining full undergraduate standing, by passing an examination prescribed by the Board of Matriculation Examiners. Credit will be given, in the undergraduate course, for the work done by such Undergraduates while attending as Conditioned Students.

Matriculation Examination conditions must be removed before the commencement of the second Session after entrance; they cannot be carried forward into any subsequent year.

PARTIAL STUDENTS

Partial Students may, subject to the approval of the Professor, attend any class without previous examination.

Partial Students who subsequently obtain undergraduate standing by passing the Matriculation Examination may, as Undergraduates, be exempted, at the discretion of the Faculty, from a particular course or courses of lectures which they have attended as Partial Students.

Partial Students who pass the First Year Sessional Examinations are not, *ipso facto*, qualified for undergraduate standing in the Second Year.

MATRICULATION.

(All inquiries relating to the Matriculation Examination should be addressed to the Secretary of the Board of Matriculation Examiners.)

SUBJECTS REQUIRED FOR MATRICULATION.

The subjects of the Matriculation Examination required by the respective Faculties are as follows:

Faculty of Arts.

For candidates intending to take the B.A. course:

1. **English** (including **History**).
2. **Mathematics, Part I.**
3. **Latin** *or* **Greek.**
4. **Greek** *or* **Latin** (if not already taken).
   or **two Modern Languages.**
   or one **Modern Language** with **Mathematics, Part II.**
5. One of the following: **Physiography, Botany, Chemistry Physics,** or a **Language** not previously taken

For candidates intending to take the B.Sc. course.

1. **English** (including History).
2. **Mathematics, Part I.**
3. One of the following:
   Latin, Greek, French, German.
4. One of the following:
   Physiography, Botany, Chemistry, Physics, a **Language** from (3) not previously taken, *or* **Mathematics, Part II.**

In and after June, 1901, an additional language will be required.

Candidates who intend ultimately to proceed to the study of Medicine are reminded that for Medical Registration it will be necessary to take Latin.

Faculty of Applied Science.

1. **English** (including **History**).
2. **Mathematics, PartI.**
3. **Mathematics, Part II.**
4. **French** *or* **German** *or* **Greek** *or* **Latin.**

In 1901 and subsequently,

5. One of the following: **Physiography, Botany, Chemistry Physics,** or a **Language** from (4) not previously taken.

In addition to those who qualify on certificates mentioned on p. 16, par. 9, students who have completed one or more years of the Arts Course may enter this Faculty on passing an examination in the additional mathematics, if any, required for Matriculation into the Faculty of Applied Science.

Faculty of Law.

1. **English** (including **History**).
2. **Mathematics, Part 1.**

3. **Latin.**
4. **French.**
5. One of the following:

Physiography, Botany, Chemistry, Physics, or a **Language** not previously taken.

Candidates must attain to a high standard in Latin and French.

In addition to the certificates mentioned on p. 16, par. 9, the following are accepted in lieu of the Matriculation Examination for entrance in this Faculty:

The Degree of Bachelor of Arts, Bachelier-es-Lettres, or Bachelier-es-Sciences, obtained from any Canadian or other British University. A certificate of having passed the examination required by the Council of the Bar of the Province of Quebec. One or the other of these qualifications is required by the Legislature for admission to study for the legal profession in the Province (see p. 211.)

Faculty of Medicine.

1. **English (including History).**
2. **Mathematics, Part I.**
3. **Latin.**
4. **One of the following:**

French, German, Greek. Chemistry, or Physics.

In addition to the certificates mentioned on p. 16, par. 9, the following are accepted in lieu of the Matriculation examination for entrance into the Faculty:

The Degree of Bachelor of Arts obtained from any recognized university.

A certificate of having passed the Examination of a Provincial Medical Council.

In the case of candidates from the United States, a certificate of having passed a State or University Examination fully equivalent to the Matriculation Examination required for Entrance in the Unversity.

All certificates must cover Latin.

The examination requirements for those who intend to practise medicine in any of the Provinces of Canada, or in Great Britain and Ireland and the British Colonies will be found on pp. 223 *et seqq.*

Faculty of Comparative Medicine and Veterinary Science.

The Matriculation Examination for the Faculty of Comparative Medicine and Veterinary Science is held separately. Details of this Examination will be found on p. 272.

DETAILS OF THE EXAMINATION.

I. English.—*Writing from Dictation.*

Grammar.—A paper on English grammar, including Analysis. The candidate will be expected to show a good knowledge of Accidence, as treated in any grammar prepared for the higher forms of schools. A similar statement applies to *grammatical* Analysis. Candidates are required to state the class to which any *subordinate* sentence belongs and to arrange and define the various members of all sentences set. *Failure in Analysis and Parsing will cause the rejection of the paper.* West's Elements of English Grammar is recommended as a text-book, and attention is particularly directed to pages 197-216.

English History.—Candidates will be required to give the chief details of leading events. While any text-book written for the upper forms of schools may be used in preparation for the examination, GARDINER'S Outline of English History (Longmans) is recommended.

Composition.—Candidates will write a short essay on a subject given at the time of the examination.

Literature, 1900, 1901, 1902.—(*a*) SCOTT'S Lady of the Lake (ed. Stuart, Macmillan; *or* Selections from Tennyson, Part I. (ed. Rowe and Webb, Macmillan); (*b*) SHAKSPERE'S Richard II (ed. Deighton, Macmillan).

In 1900 the requirements for the Junior Matriculation English of the University of Toronto* for that year will be accepted in place of (*a*) SCOTT'S Lady of the Lake, *or* Selections from Tennyson, and (*b*) SHAKSPERE'S Richard II.

In 1901† and 1902†† the requirements for the Junior Matriculation English of the University of Toronto for those years will be accepted in place of one only of the following: (*a*) SCOTT'S Lady of the Lake, *or* Selections from Tennyson, *or* (*b*) SHAKSPERE'S Richard II.

Mathematics, Part I.

Geometry.—Euclid's Elements, Books I, II, III, with easy deductions; *or* an equivalent.

Arithmetic.—Elementary Rules, Vulgar and Decimal Fractions, Pro-

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* 1900 LONGFELLOW: Evangeline, a Psalm of Life, Wreck of the Hesperus, "The day is done," The Old Clock on the Stairs, The Fire of Driftwood, Resignation, The Warden of the Cinque Ports, Excelsior, The Bridge, A Gleam of Sunshine

WORDSWORTH: The Education of Nature ("Three years she grew.") She was a phantom of delight," A Lesson ("There is a flower the Lesser Celandine"), To the Skylark, The Green Linnet, To the Cuckoo, To the Daisy, and the following Sonnets: To a Distant Friend ("Why art thou silent?"), England and Switzerland ("Two voices are there,") "Milton thou shouldst be living at this hour," Westminster Bridge, The Inner Vision "(Most sweet it is with unuplifted eyes,") "O Friend! I know not which way I must look," To Sleep, Within King's College Chapel.

†1901 TENNYSON: Elaine, Lady of Shalott, St. Agnes' Eve, Sir Galahad, Lotos-Eaters, Ulysses, Crossing the Bar, Early Spring, "You ask me why," "Of old sat Freedom," "Love thou thy land," the six interlude songs and "Tears, Idle Tears," in "The Princess."

††1902. SCOTT: Lay of the Last Minstrel.

portion, Percentage, Simple Interest, etc., Square Root and a knowledge of the Metric System.

Algebra.—Elementary Rules, Involution, Evolution, Fractions, Indices, Surds, Simple and Quadratic Equations of one or more unknown quantities; as in Hall and Knight's Elementary Algebra to end of Surds (omitting portions marked with an asterisk) *or* similar text-books.

Mathematics, Part II.

Geometry.—Euclid's Elements, Books IV and VI, with definitions of Book V; and easy deductions; *or* an equivalent.

Algebra.—The three Progressions, Ratio, Proportion, Variation, Permutations and Combinations, Binomial Theorem, Logarithms, Interest and Annuities; as in remainder of Hall and Knight's Elementary Algebra, omitting chaps. 36, 40, 41, 42, *or* similar elementary text-books.

Trigonometry.—Measurement of angles, Trigonometrical ratios or functions of one angle, of two angles, and of a multiple angle; as in Hamblin Smith, pp. 1-105 (in 1900, pp. 1-100, omitting chap. XI); or as in Lock's Elementary Trigonometry, chaps I-XII, *or* similar text-books.

Greek.—*Grammar.*

Texts (Translation and grammatical study):—

For 1900, XENOPHON, Anabasis I.

For 1901, XENOPHON, Anabasis I *or* II.

For 1902, XENOPHON, Anabasis I *or* II.

Translation at Sight and Prose Composition (sentences or easy narrative based upon the prescribed texts).

Candidates may present an equivalent amount from the works prescribed for the Junior Matriculation Examination of the University of Toronto; and at the September Examination other works equivalent to those specified may be accepted if application be made to the Secretary of the Board of Matriculation Examiners at least a month before the day of examination.

Latin.—*Grammar.*

Texts (Translation and grammatical study):—

For 1900, CAESAR, De Bello Gallico I and II, *or* V and VI; VIRGIL, Aeneid I *or* II.

For 1901, CAESAR, De Bello Gallico II and III; VIRGIL., Aeneid II.

For 1902, CAESAR, De Bello Gallico IV and V; VIRGIL, Aeneid II.

Translation at Sight and Prose Composition (sentences or easy narrative, based upon the prescribed prose text).

Candidates may present an equivalent amount from the works pre-

scribed for the Junior Matriculation Examinations of the University of Toronto; and at the September examination other works in Greek or Latin equivalent to those specified may be accepted, if application be made to the Secretary of the Board of Matriculation Examiners, at least a month before the day of examination.

French.—For 1900, 1901 and 1902.

Grammar (Accidence and Syntax). Candidates will be required to possess an exact knowledge of the common elements; Bertenshaw's French Grammar is recommended as containing the amount required for the examination.

Translation at sight from French into English. Translation into French of easy English passages. Brief reproduction in French of a story read by the examiner in English.

German.—*Grammar.*—A thorough knowledge of German Accidence.

Translation.—Candidates must be able to translate into German with tolerable correctness exercises approximately equal in difficulty to those contained in the First Part of VAN DER SMISSEN's High School German Grammar *or* in the First and Second Parts of the JOYNES-MEISSNER German Grammar (Heath & Co.).

Texts (translation and grammatical study):—

For 1900, JOYNES, German Reader, and BAUMBACH, Der Schwiegersohn.

For 1901, LEANDER, Träumereien (Copp, Clark Co.).

For 1902, LEANDER, Träumereien (Copp, Clark Co.).

Candidates may substitute for the foregoing texts those prescribed for the Junior Matriculation Examination of the University of Toronto, *or* of Dalhousie University, or those prescribed for the Leaving Examinations of Nova Scotia if notice be given to the Secretary of the Board of Matriculation Examiners at least a month before the day of examination.

Physiography.—The elements of the Science—as in TARR's First Book of Physical Geography, *or* HINMAN's Eclectic Physical Geography, *or* other text-book covering the same ground.

Botany.—As in GROOM's Elementary Botany, with PENHALLOW's Guide to the Collection of Plants, and Blanks for Plant Description.

Credit will be given for plant collections. These must be forwarded to Montreal for examination. The collections will be returned, if desired, at the expense of the school or individuals to whom they belong.

Any plant of the same family may be substituted for any one of those specified in Part II of GROOM's Elementary Botany, according to requirements of the locality.

Chemistry.—Elementary Inorganic Chemistry, comprising the preparation and properties of the chief non-metallic elements and their more important compounds, the laws of chemical action, combining weight, etc. (The ground is simply and effectively covered by REMSEN's "Elements of Chemistry," pp. 1 to 160.)

Physics.—Properties of Matter; Elementary Mechanics of Solids and Fluids, including the Laws of Motion, Simple Machines, Work, Energy; Fluid Pressure and Specific Gravity; Thermometry, The effects and modes of transmission of Heat. (See, for instance, GAGE's Introduction to Physical Science, ch. I-V.)

MATRICULATION EXAMINATION REGULATIONS.

1. Matriculation Examinations (for entrance in all Faculties except the Faculty of Comparative Medicine and Veterinary Science) are held only in June and September. The examinations are held in June at McGill College, the Royal Victoria College and at local centres; in September at McGill College, the Royal Victoria College, and affiliated Colleges only.

2. The examinations in 1900 will commence on 11th June and 17th September. Special arrangements may be made for the examination of candidates who are prevented by severe illness or domestic affliction from presenting themselves on these dates.

The time-table for the September Examination will be as under:—

Mon. 17th, 9 a.m.—Latin Books and Sight Translation.
2 p.m.—Latin Grammar and Composition.
Tues. 18th, 9 a.m.—Mathematics, Part I (Euclid).
2 p.m.—Mathematics, Part I (Arithmetic and Algebra).
Wed. 19th, 9 a.m.—English Grammar and History.
2 p.m.—English Literature, Dictation, Composition.
Thur. 20th, 9 a.m.—French.
2 p.m.—German.
Frid. 21st, 9 a.m.—Mathematics, Part II.
2 p.m.—Physiography, Botany, Chemistry, Physics.
Mon. 24th, 9 a.m.Greek Books and Sight Translation.
2 p.m.—Greek Grammar and Composition.

3. The fee for the examination is payable, except in the case of examination at a local centre (see below), to the Registrar of the University, or the Secretary of the Board of Matriculation Examiners.

4. In order to obtain an examination at a local centre, any Head Master or other person must, before May 10th, submit to the Secretary of the Board of Matriculation Examiners, the name of some suitable person, preferably a University Graduate, who is willing to act as Deputy Examiner, *i.e.*, receive the questions, hold the examinations, and forward the answers to Montreal.

The fee for this local examination must be paid to the Deputy Examiner before the commencement of the examination. The University will not be responsible for local expenses.

5. Candidates may take Arithmetic, and all the English subjects except Literature at the Matriculation Examination of one year, and the remainder at the Matriculation Examination of the following year.

6. Candidates who fail in one or more subjects at the June Examination, or who have taken part only of the examination, and present themselves again in the following September, will be re-examined in all subjects except those in which the Examiners have reported them as having obtained not less than 50 per cent.

7. Candidates who fail to pass at the September Examination may, if so recommended by the Board of Matriculation Examiners, enter the First Year Undergraduate Course as Conditioned Students, with the view of subsequently obtaining full undergraduate standing by passing an examination prescribed by the Board of Matriculation Examiners.

8. Candidates who have passed Academy Grade II of the Province of Quebec, or the Preliminary subjects of the University School (A. A.) Examinations, are exempt from examination in Arithmetic, English Grammar, Dictation, and English History.

9. The following examinations are accepted *pro tanto* in lieu of the Matriculation Examination, *i.e.*, in so far as the subjects and standard are, to the satisfaction of the Board of Matriculation Examiners, the same as and equivalent to those required for the Matriculation Examination of the University; but candidates offering certificates of having passed such examinations will be required to make good their standing by passing the Matriculation Examination in such of the required subjects, if any, as are not covered by their certificates:

The University School (A.A.) Examinations.

The First Year Entrance Exhibition Examinations, particulars of which are set out on pp. 39-42.

The Model School Diploma Examinations of the McGill Normal School, under conditions.

The Matriculation or Leaving Examinations accepted by the universities of Ontario.

The Leaving Examinations of Nova Scotia.

The Matriculation Examination of Dalhousie University.

The Leaving Examination of Prince of Wales College, P.E.I.

Applications for exemption from the matriculation examination based upon certificates of having passed some examinations other than those above mentioned will be considered as occasion may require by the Board of Matriculation Examiners.

Every such application must be accompanied by the certificates and full particulars, and should be addressed to the Secretary of the Board.

MATRICULATION FEES.

For the Matriculation Examination.. .. ..$5 00
For candidates who take the examination in part or who, through failure or other cause, do not complete it—for the first examination.. .. .. 5 00
For any subsequent examination.. .. .. 2 00
For examination of certificates, other than A.A. Certificates, in respect of which candidates are exempted from the whole of the Matriculation Examination... 1 00

Candidates who have passed the University School (A.A.) Examination in the required matriculation subjects, and desire to enter the University, are required to pay the same fee as that for the Matriculation Examination, viz., $5.00, less any sum already paid in connection with the University School (A.A.) Examination.

Candidates for First Year Entrance Exhibitions who have paid the matriculation fee as above provided, may compete in the Exhibition Examinations free of charge. Other candidates for the Exhibitions will pay the same fee as that for the Matriculation Examination, viz., $5.00; the First Year Entrance Exhibition Examination being in that case regarded as a matriculation examination.

Certificates will be issued to candidates successful in the matriculation examinations without additional fee. Duplicate certificates will not be granted unless satisfactory proof be given of the loss or destruction of the original. The fee for a duplicate certificate is One Dollar.

ADMISSION TO SECOND YEAR.

Admission to the Second Year is open, as a rule, only to Undergraduates who have passed the First Year Sessional Examination in regular course, but in exceptional cases, to be dealt with by the Faculty in which they desire to register, candidates may be admitted directly to the Second Year without having passed through the curriculum of the First Year.

STUDENTS OF OTHER UNIVERSITIES APPLYING FOR EQUIVALENT STANDING.

Any student of another University desirous to be admitted to this University with equivalent standing is requested to send with his application:—

1st.—A Calendar of the University in which he has studied, giving a full statement of the courses of study.

2nd.—A complete statement of the course he has followed.

3rd.—A certificate of the standing gained, and of conduct.

These will be submitted to the Faculty in which he desires to register.

The Faculty, if otherwise satisfied, will decide what examination, if any, or what conditions, may be necessary before admitting the candidate.

REGISTRATION.

1. Candidates for entrance (Undergraduates, Conditioned Students and Partial Students), are required to attend at the office of the Registrar of the University for the purpose of giving their addresses and other particulars, and of signing the following declaration in the Matricula or Register:

"I hereby declare that I will faithfully observe the Statutes, rules, and ordinances of this University of McGill College to the best of my ability."

2. Every Undergraduate or Conditioned Student must produce to the Registrar of the University* his Matriculation Certificate or other certificate accepted or qualifying the candidate for entrance. The candidate is then entitled to enter as an undergraduate or conditioned student, as the case may be, in the Faculty in which he desires to register.

3. After registration and payment of the required fees, the student will be given tickets of admission to the classes which he is entitled to attend. The tickets of admission must be shown at the commencement of the session to the Dean of the Faculty† in which the student is registered, and also to the

*In the case of students in Medicine, to the Registrar of the Faculty of Medicine. In the case of students in Comparative Medicine, to the Registrar of the Faculty of Comparative Medicine and Veterinary Scien

Professor or Lecturer in charge of any class attended by him.

4. After the lapse of a fortnight from the commencement of lectures, Professors and Lecturers in charge of classes will require every attending student to produce his ticket of admission, and will report to the Dean † the name of any student failing to produce it; and if, thereafter, upon notice by the Dean to the Professor or Lecturer, the student is not able to produce his ticket of admission, the Professor or Lecturer will prohibit him from further attendance, and will report to the Dean† accordingly; and similarly in the case of students joining the class during the course of the session.

DEGREES.

The Degrees of B.A., B.Sc., B.C.L., M.D., C.M., and D.V.S, can only be obtained by attendance at the lectures and passing the examinations of the undergraduate courses.

Regulations for the Degree of B.A.

Students who shall have satisfactorily completed the Regular Course of Study in Arts, shall have passed the prescribed examinations during the Course, and also the special examinations for graduation, and shall have performed such exercises as may be prescribed to that end, shall be entitled to the Degree of Bachelor of Arts.

Regulations for the Degree of B.Sc.

Students who shall have satisfactorily completed the prescribed Course of Study in the Faculty of Arts for the Degree of Bachelor of Science, or the Course of Study in the Faculty of Applied Science, shall have passed the prescribed examinations during the Course, and also the special examinations for Graduation, and shall have performed such exercises as may be prescribed to that end, shall be entitled to the Degree of Bachelor of Science.

†In the case of the Faculty of Medicine to the Registrar of that Faculty.

Regulations for the Degree of B.C.L.

Students who shall have satisfactorily completed the Regular Course of Study in Law, shall have passed the prescribed examinations during the Course and also the special examinations for Graduation, shall be entitled to the Degree of Bachelor of Civil Law. A Bachelor or Master of Arts, or an Articled Student with a practising Member of the Bar of the Province of Quebec, who shall have matriculated in the third year of his Clerkship under such articles, shall be entitled to such Degree after two years' attendance on the said Course of Study, if he shall satisfactorily pass all requisite examinations, and perform all required exercises.

Regulations for the Degree of M.A.

Bachelors of Arts of at least one year's standing who (*a*) shall have taken for one year a graduate course of study in Arts in the University, previously submitted to and approved by the Faculty, and (*b*) shall have passed an examination at the end of the course, and (*c*) shall have presented, if required, a satisfactory thesis, shall be entitled to the Degree of Master of Arts. Bachelors of Arts of at least two years' standing who shall have presented a satisfactory thesis and passed a special examination, shall be entitled to the Degree of Master of Arts.

Any Bachelor of Arts who graduates prior to May 1st, 1899, or any Undergraduate in Arts registered at that date, and proceeding thereafter to the Degree of Bachelor of Arts, shall at his option be entitled to the Degree of Master of Arts on the following conditions:

1. A candidate must be a Bachelor of Arts of at least three years' standing.

Thesis:

2. He is required to prepare and submit to the Faculty a thesis on some literary or scientific subject, under the following rules:—

(*a*) The subject of the thesis must be submitted to the Faculty before the thesis is presented.

(*b*) A paper read previously to any association, or published in any way, cannot be accepted as a thesis.

(*c*) The thesis submitted becomes the property of the University, and cannot be published without the consent of the Faculty of Arts.

(*d*) The thesis must be submitted before some date to be fixed annually by the Faculty, which date must not be less than two months before the candidate proceeds to the Degree.

The last day in the session of 1900-1901 *for sending in Theses for M.A. will be Jan.* 31*st,* 1901.

Examinations:

3. All candidates, except those who have taken First or Second Rank B.A. Honours, or have passed First Class in the Ordinary Examinations for the Degree of B.A., are required to pass an examination also, either in Literature or in Science, as each candidate may select.

(*a*) The subjects of the Examination in *Literature* are divided into two divisions as follows:—

Group A.—Latin, Greek, Hebrew.

Group B.—French, German, English.

(*b*) The subjects of the Examination in *Science* are divided into three divisions:—

Group A. — Pure Mathematics (advanced or ordinary) **Mechanics** (including Hydrostatics), **Astronomy, Optics.**

Group B.—Geology and Mineralogy, Botany, Zoology, Chemistry.

Group C.—Mental Philosophy, Moral Philosophy, Logic, History of Philosophy.

(*c*) Every candidate in Literature is required to select for Examination two subjects out of one group in the *Literature* section, and one out of the other group in the same section. Every candidate in Science is required to select two out of the three groups in the *Science* section; and in one of the groups so chosen to select for Examination two subjects, and in the other group one subject.

(*d*) One of the subjects selected as above will be considered the principal subject (being so denoted by the candidate at the time of application), and the other two as subordinate subjects.

(*e*) The whole examination may be taken in one year, or distributed over two or three years, provided the examination in any one subject be not divided.

For further details of the examination, application must be made to the Faculty before the above date.

The fee for the degree is $20; *in absentia*, $40. (In case of failure, the candidate may present himself in a subsequent year without further payment of fees.) The examination will be held in April in McGill College only. A candidate after fulfilling all the conditions ought to notify the Faculty of his desire to proceed to the degree at the next convocation.

Candidates who obtained the degree of B.A. before 1884 *may proceed to the degree of M.A. under the regulations in force previous to* 1884.

Lectures to Graduates:

Lectures are open to Bachelors of Arts who are candidates for M.A., the sessional examinations corresponding to these lectures being reckoned as parts of the M.A. examination. The subjects are Greek, Latin, English, French, German, History, Mental and Moral Philosophy, Chemistry, Botany, Zoology, Geology and Mineralogy. Certificates of standing will be given.

Regulations for the Degree of M.Sc.

Bachelors of Arts or Bachelors of Science of at least one year's standing who shall have taken for one year a Graduate Course of Study in the Faculty of Arts or the Faculty of Applied Science of the University previously submitted to and approved by the Faculty, shall have passed an examination at the end of the year, and shall, if required, have presented a satisfactory thesis; or Bachelors of Arts, or Bachelors of Science of at least two years' standing who shall have

presented a satisfactory thesis, and shall have passed a special examination for the degree shall be entitled to the Degree of Master of Science.

The fee for the degree is $20; *in absentia*, $40.

Regulations for the Degree of M.D.

Students who shall have satisfactorily completed the Regular Course of Study in Medicine shall have passed the prescribed examinations during the course, and also the special examinations for Graduation shall be entitled to the Degree of Doctor of Medicine and Master of Surgery.

Regulations for the Degree of D.V.S.

Students who shall have satisfactorily completed the Regular Course of Study in Comparative Medicine and Veterinary Science shall have passed the prescribed examinations during the course, and also the special examinations for Graduation, shall be entitled to the Degree of Doctor of Veterinary Surgery.

Regulations for the Degree of D.Litt.

Candidates for the Degree of Doctor of Literature must be Masters of Arts, who, being graduates at least of five years' standing, shall have distinguished themselves by special research and learning in the domain of Literature or Philosophy. They are required to present a satisfactory thesis or published work.

The fee for the degree is $80.

Regulations for the Degree of D.Sc.

Candidates for the Degree of Doctor of Science must be Masters of Arts or Masters of Science, or Doctors of Medicine, who, being graduates of at least five years' standing, shall have distinguished themselves by special research and learning in the domain of Science. They are required to present a satisfactory thesis or published work.

The fee for the degree is $80.

Regulations for the Degree of D.C.L.

Candidates for the Degree of Doctor of Civil Law must be Bachelors of Civil Law of at least twelve years' standing. They are required to pass a special examination for the degree and to present a satisfactory thesis or published work on some subject selected or approved by the Faculty of Law. For details of the examination, etc., see pp. 208-210.

The fee for the degree is $80.

Regulations for the Degree of LL.D.

Except as hereinafter mentioned, the Degree of Doctor of Law is given only as an honorary degree.

Any person who matriculated and attended lectures in the Faculty of Arts before the 31st January, 1899, may proceed to the Degree of Doctor of Laws in course upon the following conditions:

Candidates for the Degree of LL.D. in course must be Masters of Arts of at least twelve years' standing, and are required to prepare and submit to the Faculty of Arts, not less than three months before proceeding to the degree, twenty-five printed copies of a thesis on some Literary or Scientific subject which has been *previously approved by the Faculty*. The thesis must exhibit such a degree of literary or scientific merit, and give evidence of such originality of thought or extent of research as shall, in the opinion of the Faculty, justify recommendation for the degree.

Candidates are also required to submit, with their thesis, a list of books treating of some one branch of Literature or of Science satisfactory to the Faculty in which they are prepared to submit to examination, and in which they shall be examined, unless otherwise ordered by the Faculty.

The fee for the degree in course is $80.

ACADEMIC DRESS.

Professors, Lecturers and Students, etc., are required to wear a black college cap and gown in going to the class-rooms and returning thence, and during lectures, except in those cases in which a dispensation shall have been granted by the Faculty.

ATTENDANCE AND CONDUCT.

1. Punctual attendance on all his classes is required of each student.

2. A record shall be kept by each Professor or Lecturer, in which the presence or absence of Students shall be carefully noted. The record shall be submitted to the Faculty at all their ordinary meetings during the Session.

3. Credit for attendance on any lecture or class may be refused on the grounds of lateness, inattention, neglect of study or disorderly conduct in the class-room or laboratory. In the case last mentioned, the student may, at the discretion of the Professor, be required to leave the room. Persistence in any of the above offences against discipline shall, after admonition by the Professor, be reported to the Dean of Faculty. The Dean may, at his discretion, reprimand the student, or refer the matter to the Faculty at its next meeting, and may in the interval suspend from classes.

4. Absence from lectures can only be excused by necessity or duty, of which proof must be given, when called for, to the Faculty. The number of times of absence, from necessity or duty, that shall disqualify from the keeping of a session shall in each case be determined by the Faculty.

5. Any student found guilty of dishonest practices at an examination shall be liable to expulsion from the University, or to be suspended for a term of years.

6. While in college, or going to or from it, Students are expected to conduct themselves in the same orderly manner as in the class-rooms. Smoking is prohibited in the College buildings, except in such rooms, if any, as may be set apart for that purpose. Any Professor observing improper conduct in the College buildings or grounds may admonish the student, and, if necessary, report him to the Dean. Without as well as within the walls of the College, every student is required to maintain a good moral character.

7. When students are brought before the Faculty under the above rules, the Faculty may reprimand, report to parents or guardians, impose fines, disqualify from competing for

prizes or honours, suspend from classes, or report to the Corporation for expulsion.

8. Any student damaging the furniture or buildings will be required to bear the expense of repairing or making good the same, and will, in addition, be subject to such other penalty as the Faculty may see fit to inflict. If individual responsibility for damage cannot be traced, a *pro rata* assessment may be made on all the students more directly concerned.

9. All cases of discipline involving the interests of more than one Faculty, or of the University in general, shall be immediately reported to the Principal, or, in his absence, to the Vice-Principal.

10. Petitions from the students to any University body on any subject can, in general, be taken into consideration only at the regular meetings appointed in the Calendar.

CONDUCT OF EXAMINATIONS.

1. The supervision of the examinations of the University is entrusted largely to officers specially appointed from year to year in sufficient numbers for the purpose. An attendant is present in the Examination Hall throughout each examination.

2. Examination papers are provided in the form of books, with covers in special colours. Each book contains a statement of the duties of candidates, and to each is attached a small envelope containing a card or slip for the name of the candidate.

3. Each colour has a number, and only one colour is employed at a given examination. A certain scheme of colours is arranged beforehand for the whole period of the examination.

4. The seating of the students is arranged in advance, and is posted at the entrance of the Hall fifteen minutes before the commencement of the examination.

5. The Faculty or a Committee of the Faculty concerned, will arrange for at least one examiner and such other paid examiners as are deemed necessary to be present in the Hall

for each examination; and will also arrange the scheme of seating and books to be used.

Duties of Examiners.

6. All examiners are expected to attend strictly to the supervision of the examinations while they are in the Hall.

7. They shall instruct each candidate to write the number of his table on the outside of his book; to write his name plainly upon the card provided in the envelope on the book; to replace it and seal the envelope.

After this has been done, the examination papers are distributed. Any candidate entering late will be required to sign his card and close the envelope before receiving the examination paper.

The examiners shall also call the attention of the candidates to the rules printed upon the envelope.

8. During the course of the examinations the examiner shall verify the position of each candidate in the examination hall according to a plan.

9. For the convenience of candidates, the examiners may announce the time when half of the period allowed for the examination has expired; and also at thirty minutes and five minutes before the close.

Duties of Candidates.

10. Before beginning to write on the examination, candidates should write their names plainly on the slip provided in the envelope, and enclose it, fastening the envelope, and write the number of their desk or table plainly on the cover of the examination book.

11. No candidate shall be permitted to enter the examination room after the expiry of one-half hour, or leave it before the expiry of one-half hour, from the commencement of the examination. Any candidate leaving the examination room after the issue of the examination papers in any subject, shall not be permitted to return during the course of that examination.

12. Candidates guilty of any of the following or similar dishonest practices shall be immediately dismissed from the examination, and shall be liable to permanent disqualification for membership in McGill University:—

A. Making use of any books, papers, or memoranda, other than those provided by the examiners.

B. Speaking or communicating with other candidates under any circumstances whatever.

C. Exposing written papers to the view of other candidates.

The Plea of Accident or Forgetfulness shall not be Received.

13. Candidates shall write their answers on the right hand pages of the Regulation Answer Book provided for the purpose by the University, entering on the margin nothing but the number or letter of the question they are about to answer. The left-hand page may be used for rough drafts or for scribbling purposes. No other paper than the regulation answer book above mentioned shall be used by the candidates, and no pages removed from the books.

14. Candidates are not permitted to leave their places. Should they desire anything, they may signify it by standing up.

15. When the examiner announces that the examination is over, all candidates must leave the hall. On leaving the hall, the examination books must be deposited by the candidates as directed by the examiners.

UNIVERSITY BUILDINGS.

The Centre Building.

This building, the first and oldest building of McGill College, contains the lecture-room of the Faculty of Arts and the Botannical Laboratories in the centre. The East Wing contains the newly equipped Zoological Laboratories, the offices of the Administration, and the lecture-rooms of the Faculty of Law. The West Wing comprises the Molson Convocation and Examination Hall and the Corporation Meeting-room.

The Botanical Laboratories are described in detail on pp. 110, 111; the Zoological Laboratories on pp. 111, 112.

The Macdonald Engineering Building.

The Engineering Building, erected, equipped and endowed by Sir William C. Macdonald, represents, in architectural effect, a severe treatment of the Italian renaissance. Besides numerous lecture-rooms, students' rooms, a departmental library, and a large technical museum, which holds the Reuleaux collection of Kinematic models—believed to be the most complete in America, the building contains large and thoroughly equipped electrical and magnetic laboratories; dynamo rooms; lighting station; accumulator room; laboratories of Mathematics, Dynamics, Mechanics, Geodesy, Modelling, Testing, and Thermodynamics; workshops (in the annex erected under the bequest of the late Thomas Workman) for Carpentry, Wood-turning, and Pattern-making; Machine shops; Smithy; Foundry; etc.

The whole of one floor is given up to Drawing-rooms, and the Museum of the building contains a large collection of casts illustrative of the historical development of the various styles of architecture and of casts of architectural and figure sculpture.

A detailed description of the laboratories and workshops and their equipment is given on pp. 171 *et seq.*

Macdonald Chemistry and Mining Building.

Admirable facilities are afforded in the Macdonald Chemistry and Mining Building for study and research in the various departments of Chemistry. The building, also erected, equipped and endowed by Sir William C. Macdonald, is spacious, admirably lighted, heated by hot water, and ventilated by means of electric fans, one placed in the basement and two in the attic. In addition to the main lecture-room, which seats about 250 students, the building contains three large general Chemical Laboratories, and a number of smaller laboratories and rooms for special purposes, including research work in Inorganic and Organic Chemistry and in Mineralogy and Petrography. Among the special laboratories may be mentioned those for Organic Chemistry, Physical Chemistry, Electrolytic Analysis, Gas Analysis, Iron and Steel Analysis, Water Analysis, Photography, Determinative Mineralogy, etc.

A detailed description of the laboratories and their equipment is given on pp. 109, 110.

The Mining and Metallurgical Laboratories are in the Chemistry and Mining building, and comprise Mining and Ore-dressing, Milling, Metallurgical, Assay and wet assaying laboratories; Lecture-rooms; Library; Drawing-room; etc. The machinery of these laboratories is of full size, and all investigations can be carried out in all respects under working conditions. ,

A detailed description of the laboratories and their equipment is given on pp. 181-184.

The Macdonald Physics Building.

The Macdonald Physical Laboratory, another of Sir William C. Macdonald's gifts to the University, contains five storeys, each of 8,000 square feet area. Besides a lecture theatre and its apparatus rooms, the Building includes an elementary laboratory nearly 60 feet square; large special laboratories arranged for higher work by advanced students in Heat and Electricity; a range of rooms for optical work and photography; separate rooms for private thesis work by students; and two large laboratories arranged for research, provided with solid piers and the usual standard instruments. There are also a lecture room, with apparatus room attached, for Mathematical Physics, a special physical library, and convenient workshops. The equipment is on a corresponding scale, and comprises: (1) apparatus for illustrating lectures; (2) simple forms of the principal instruments for use by the students in practical work; (3) the most recent types of all important instruments for exact measurement, to be used in connection with special work and research.

A detailed description of the laboratories and their equipment is given on pp. 107, 108.

Medical Buildings.

The present main building of the Faculty of Medicine was erected in 1873. In 1885, and again in 1893, large additions and alterations were made to the buildings. These again, however, have proved inadequate, and a thorough reconstruction and enlargement of the buildings is about to be undertaken, a subscription of One Hundred Thousand Dollars having been generously made to this end by the Chancellor of the University in the name of Lady Strathcona and Hon. Mrs. Howard. The present buildings comprise several large lecture theatres, a large reading-room, managed by the students themselves; a fine medical library; dissecting-rooms; and a large number of completely equipped laboratories for Physiology, Histology, Pharmacology, Chemistry, and Pathology, in addition to numerous museums, preparation rooms, and offices. Clinical teaching is conducted in the theatres, wards, out-patient rooms, and laboratories of the Montreal General Hospital, the Royal Victoria Hospital, and the Montreal Maternity Hospital.

A detailed description of the laboratories and museums is given in pp. 217, 258.

The Royal Victoria College for Women.

This residential college for the Women Students of McGill University, erected and endowed by Lord Strathcona and Mount Royal, is situate on Sherbrooke Street, in close proximity to the University buildings and laboratories. The Professors and Lecturers of the University are thereby enabled to give their services in the conduct of the College classes.

Full particulars of the College, terms of residence, etc., are given on pp. 118-125.

Veterinary College.

The lecture-rooms, laboratories and pharmacy of the Faculty of Comparative Medicine and Veterinary Science are situate in Union Avenue, where hospital and daily clinics are held. An extensive out-door practice in the largest stables of the city and numerous farms also afford opportunities for clinical observation.

A detailed description of the laboratories and museums is given

The University Library.

Librarian:—Charles H. Gould, B.A.
Assistant Librarian:—Henry Mott.

In the autumn of 1893, the general library was moved to the noble building erected by the late Mr. Peter Redpath. The building affords ample accommodation for two hundred readers, the reading room being exceptionally spacious and convenient. The latter is open in the evening, and contains a reference library and leading English and Foreign periodicals.

Mrs. Peter Redpath, of the Manor House, Chislehurst, Kent, is, with great munificence, about to undertake an important extension to the Library building, which will further improve the facilities already offered in this department.

Mrs. Redpath's contemplated gift provides not merely a large new book stack, but also additional seminary rooms and commodious quarters for a special Law Library.

The various Libraries of the University now contain upwards of 78,000 volumes, and a large number of pamphlets.

The books have been selected with a view to illustrating the several courses of University study. They are, therefore, to a considerable extent, general in character; and the Committee endeavours to provide for the symmetrical growth of the entire library.

There are, however, several large special collections, besides the departmental libraries. The late Mr. Peter Redpath was, for years

before his death, engaged in forming the REDPATH HISTORICAL COLLECTION. This is still being added to by Mrs. Peter Redpath, is now of great value, and affords unusual opportunities for the study of English History. An important feature of the collection is a series of 3,500 political and religious tracts, which date from 1601 to about the middle of the present reign.

Abundant materials, bearing upon the History of Canada, have been gathered together. Of these the nucleus is formed by the entire library of the late Mr. Frederick Griffin, whose choice books were, some years ago, bequeathed to the University. This branch of the library is being steadily augmented.

The Medical Library, directly controlled by the Faculty of Medicine, is the largest of the departmental libraries, and is one of the most complete collections of its kind in the Dominion.

About 190 current periodicals, literary and scientific, are subscribed for through the various departments of the University. Besides these, the library regularly receives Serials, Transactions and Proceedings of Societies. The list of both periodicals and serials is being extended yearly.

Although the library is maintained primarily for members of the University, the Corporation has provided for the admission, upon certain conditions, of such persons as may be approved by the Library Committee. It is the desire of the Committee to make the library as useful to the entire community as is consistent with the safety of the books and the general interests of the University.

Extract from the Library Regulations.

1. During the College Session the Library is open daily (except Sundays and general public holidays), from 9 a.m. till 5 p.m.; and the Reading Room from 9 a.m. till 6 p.m., and also from 7.30 till 10.30 p.m. On Saturdays, both Library and Reading Room close at 5 p.m. During vacations, both Library and Reading Room close at 5 p.m., and on Saturdays at 1 p.m.

2. Students in the Faculty of Arts, of Law, and of Applied Science are entitled to read in the Library, and may borrow books (subject to the regulations) to the number of three volumes at one time.

3. Students in the Faculties of Medicine or Comparative Medicine, who have paid the Library fee to the Bursar, may read in the Library, and on depositing the sum of $5 with the Bursar, may borrow books on the same conditions as Students in other Faculties. They are required to present their Matriculation Tickets to the Bursar and to the Librarian.

4. Graduates in any of the Faculties, on making a deposit of $5, are entitled to the use of the Library, subject to the same rules and conditions as Students in Arts, Law, or Applied Science.

5. Books may be taken from the Library only after they have been charged at the Delivery Desk; borrowers who cannot attend personally must sign and date an order, giving the titles of the books desired.

6. Books in the Reference Library must not be taken from the Reading Room; and, after they have been used, they must be returned promptly by readers to their proper places upon the shelves.

7. Before leaving the Library, readers must return the books they have obtained to the attendant at the Delivery Desk.

8. All persons using books remain responsible for them so long as the books are charged to them, and borrowers returning books must see that their receipt is properly cancelled.

Writing or making any mark upon any book belonging to the Library is unconditionally forbidden. Any person found guilty of wilfully damaging any book in any way shall be excluded from the Library, and shall be debarred from the use thereof for such time as the Library Committee may determine.

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The Peter Redpath Museum.

This building was erected in 1882 by the liberal benefactor whose name it bears. It occupies a commanding position at the upper end of the campus, and besides its central hall and other rooms devoted to the collections, contains a large lecture theatre, class-rooms and work-rooms.

The general arrangement of the collections is as follows:—

1. The Botanical Room on the ground floor contains the Herbarium, consisting of 30,000 specimens of Canadian and exotic plants and collections illustrating structural and economic botany.

2. On the first floor is a room over the entrance hall, in which are cases containing archaeological and ethnological objects with large slabs of fossil foot-prints on the walls.

3. This room opens into the great Museum Hall, on each side of which are alcoves with upright and table cases containing the collections in Palaeontology, arranged primarily to illustrate the successive geological systems, and subordinately to this, in the order of zoological and botanical classification, so as to enable the student to see the general order of life in successive periods, and to trace any particular group through its geological history.

4. At the extreme end of the Hall are placed the collections of minerals and rocks, arranged in such manner as to facilitate their systematic study. In the centre of the Hall are economic collections and large casts and models.

5. In the upper story or gallery of the great Hall are placed the zoological collections; the invertebrate animals in table cases in regular series, beginning with the lower forms; the vertebrate animals in upright cases, in similar order. The PHILIP CARPENTER COLLECTION of shells is especially noteworthy for its arrangement and completeness.

Details as to the several departments of the Museum are given in the "Museum Guide," and papers or memoirs relating to type specimens in the collections can be obtained from the Museum Assistant. Tickets are issued to students by the Professors in charge of the several departments, and classes of pupils from schools can be admitted on certain days, under regulations which may be learned from the Professors or from the Registrar of the University.

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PERCY C. RYAN, B.C.L.
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J. GEORGE ADAMI, M.A., M.D. (Cantab. and McGill), F.R.S.E., late Fellow of Jesus College, Cambridge.
Professor of Pathology and Director of Medical Museum. 331 Peel Street.
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JOHN McCREA, B.A., M.D., Fellow in Pathology. McGill College.

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Demonstrator of Anatomy. 59 Metcalfe Street.

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Demonstrator of Pharmacy. 164 Peel Street.

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H. D. HAMILTON, M.D. *Demonstrator of Laryngology.*	141 Crescent Street.
D. P. ANDERSON, B.A., M.D. *Assistant Demonstrator of Pathology.*	35 Park Av.
T. P. SHAW, M.D. *Assistant Demonstrator of Obstetrics.*	1260 Dorchester Street.
JAMES BARCLAY, M.D. *Assistant Demonstrator of Obstetrics.*	59 Metcalf Street.
J. A. WILLIAMS, M.D. *Assistant Demonstrator of Bacteriology.*	385 St. Antoine Street.
A. T. BAZIN, M.D. *Assistant Demonstrator of Anatomy.*	46 Richmond Square.
H. M. CHURCH, M.D. *Assistant Demonstrator of Anatomy.*	354 Greene Av.
W. G. REILLY, M.D. *Assistant Demonstrator of Anatomy.*	51 Park Av.
R. A. WESTLEY, M.D. *Assistant Demonstrator of Anatomy.*	85 Union Av.
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W. M. FISK, M.D. *Assistant Demonstrator of Histology.*	49 Prince Arthur Street.
E. R. BROWN, B.A., M.D. *Assistant Demonstrator of Histology.*	54 Drummond Street.
D. PATRICK, M.D. *Assistant Demonstrator of Histology.*	4186 St. Catherine Street.
A. D. IRVINE, M.D. *Assistant Demonstrator of Clinical Chemistry.*	4356 St. Catherine Street.
W. K. BROWN, M.D. *Assistant Demonstrator of Clinical Chemistry.*	99 University Street.
W. G. M. BYERS, M.D. *Assistant Demonstrator of Ophthalmology.*	192 Peel Street.

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DUNCAN McEACHRAN, F.R.C.V.S., D.V.S. *Dean of the Faculty and Professor of Veterinary Medicine and Surgery.*	6 Union Ave
MALCOLM C. BAKER, D.V.S. *Professor of Veterinary Anatomy.*	6 Union Ave
CHARLES McEACHRAN, D.V.S. *Professor of Veterinary Obstetrics and Diseases of Cattle.*	6 Union Ave.
G. P. GIRDWOOD, M.D. *Associate Professor of Chemistry.*	111 University St.

GEORGE WILKINS, M.D.
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D. P. PENHALLOW, M.Sc., F.R.S.C., F.R.M.S.
Associate Professor of Botany. McGill College

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(*The above Professors constitute the Faculty of Comparative Medicine and Veterinary Science.*)

OTHER OFFICERS OF INSTRUCTION.

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C. F. MARTIN, M.D.
Lecturer in Medicine. 33 Durocher Street.

LIBRARY.

CHAS. H. GOULD, B.A.
University Librarian. 862 Sherbrooke Street.

H. MOTT.
Assistant Librarian. 47 St. Famille Street

SEPTEMBER, 1900.

1 Saturday	Meeting of Medical Faculty. Field work in Surveying (Supplemental examination in Surveying, Aug. 31st).
2 SUNDAY	
3 Monday	Normal School opens. Meeting of Faculty of Applied Science.
4 Tuesday	Introductory Lecture in Law.
5 Wednesday	Lectures in Law begin.
6 Thursday	
7 Friday	
8 Saturday	
9 SUNDAY	
10 Monday	
11 Tuesday	Register opens for students in Medicine. College Grounds Committee.
12 Wednesday	
13 Thursday	Finance Committee.
14 Friday	
15 Saturday	Meeting of Faculty of Arts.
16 SUNDAY	
17 Monday	Matriculation, Exhibition, Scholarship and Supplemental Examinations. Engineering Building Committee: Chemistry and Mining Building Committee.
18 Tuesday	Examinations continued.
19 Wednesday	Examinations continued.
20 Thursday	Examinations continued. Introductory Lecture in Medicine. Lectures in Medicine begin.
21 Friday	Examinations continued. Meeting of Governors.
22 Saturday	Matriculation in Veterinary Science.
23 SUNDAY	
24 Monday	Examinations continued. Meeting of Faculty of Arts.
25 Tuesday	Lectures in Arts and Applied Science begin.
26 Wednesday	Lectures in Veterinary Science begin. Summer Essays in Applied Science to be sent in.
27 Thursday	
28 Friday	
29 Saturday	
30 SUNDAY	

OCTOBER, 1900.

1 Monday	Meeting of Faculty of Applied Science.
2 Tuesday	
3 Wednesday	Normal School Committee. Meeting of Academic Board.
4 Thursday	Physics Building Committee.
5 Friday	Founder's Birthday. Meeting of Faculty of Arts.
6 Saturday	The William Molson Hall opened, 1862. Meeting of Medical Faculty. Exhibition and Supplemental Examinations, Applied Science
7 SUNDAY	
8 Monday	Museum Committee: Library Committee.
9 Tuesday	College Grounds Committee.
10 Wednesday	Regular Meeting of Corporation. Annual Report to Visitor.
11 Thursday	Finance Committee.
12 Friday	University Athletic Sports.
13 Saturday	
14 SUNDAY	
15 Monday	Engineering Building Committee: Chemistry and Mining Building Committee
16 Tuesday	
17 Wednesday	
18 Thursday	
19 Friday	Meeting of Governors. Meeting of Faculty of Arts.
20 Saturday	Register closes for Students in Medicine.
21 SUNDAY	
22 Monday	
23 Tuesday	
24 Wednesday	
25 Thursday	
26 Friday	
27 Saturday	
28 SUNDAY	
29 Monday	
30 Tuesday	
31 Wednesday	New Library opened, 1893

NOTE.—Meetings of the Faculty of Arts are held at 5 P.M. unless otherwise specified.

NOVEMBER, 1900.

1 Thursday	
2 Friday	Meeting of Faculty of Arts.
3 Saturday	Meeting of Medical Faculty.
4 SUNDAY	
5 Monday	Meet ng of Faculty of Applied Science.
6 Tuesday	
7 Wednesday	
8 Thursday	Finance Committee.
9 Friday	
10 Saturday	
11 SUNDAY	
12 Monday	
13 Tuesday	College Grounds Committee.
14 Wednesday	
15 Thursday	
16 Friday	Meeting of Governors. Meeting of Faculty of Arts.
17 Saturday	
18 SUNDAY	
19 Monday	Engineering Building Committee: Chemistry and Mining Building Committee.
20 Tuesday	
21 Wednesday	
22 Thursday	
23 Friday	
24 Saturday	
25 SUNDAY	
26 Monday	
27 Tuesday	
28 Wednesday	
29 Thursday	
30 Friday	Meeting of Faculty of Arts.

DECEMBER, 1900.

1 Saturday	Meeting of Medical Faculty
2 SUNDAY	
3 Monday	Meeting of Faculty of Applied Science.
4 Tuesday	
5 Wednesday	Meeting of Academic Board.
6 Thursday	Physics Building Committee.
7 Friday	
8 Saturday	
9 SUNDAY	
10 Monday	Sessional Examinations in Medicine begin. Museum Committee: Library Committee.
11 Tuesday	College Grounds Committee.
12 Wednesday	Regular Meeting of Corporation.
13 Thursday	Finance Committee.
14 Friday	Last day of Lectures in Arts.
15 Saturday	
16 SUNDAY	
17 Monday	Christmas Examinations in Arts begin. Engineering Building Committee: Chemistry and Mining Building Committee.
18 Tuesday	
19 Wednesday	
20 Thursday	
21 Friday	Meeting of Governors. Autumn term of Faculty of Medicine ends.
22 Saturday	Christmas Vacation begins.
23 SUNDAY	
24 Monday	
25 Tuesday	Christmas-Day.
26 Wednesday	
27 Thursday	
28 Friday	
29 Saturday	
30 SUNDAY	
31 Monday	

1 Tuesday
2 Wednesday
3 Thursday
4 Friday
5 Saturday — Meeting of Medical Faculty. Meeting of Faculty of Arts. (4 p.m.)

6 SUNDAY

7 Monday — Lectures in Arts and Applied Science resumed. Winter term Faculty of Medicine begins. Lectures in Law resumed. Meeting of Faculty of Applied Science.
8 Tuesday — College Grounds Committee.
9 Wednesday — Normal School Committee.
10 Thursday — Finance Committee.
11 Friday — Meeting of Faculty of Arts.
12 Saturday

13 SUNDAY

14 Monday
15 Tuesday
16 Wednesday
17 Thursday
18 Friday — Meeting of Governors.
19 Saturday

20 SUNDAY

21 Monday — Engineering Building Committee: Chemistry and Mining Building Committee.
22 Tuesday
23 Wednesday
24 Thursday
25 Friday — Meeting of Faculty of Arts
26 Saturday

27 SUNDAY

28 Monday
29 Tuesday
30 Wednesday — Theses for M.A. and LL.D. to be sent in.
31 Thursday

FEBRUARY, 1901.

1 Friday
2 Saturday — Meeting of Medical Faculty.

3 SUNDAY

4 Monday — Meeting of Faculty of Applied Science.
5 Tuesday
6 Wednesday — Meeting of Academic Board.
7 Thursday — Physics Building Committee.
8 Friday — Meeting of Faculty of Arts.
9 Saturday

10 SUNDAY

11 Monday — Museum Committee: Library Committee.
12 Tuesday — College Grounds Committee.
13 Wednesday — Regular Meeting of Corporation
14 Thursday — Finance Committee.
15 Friday — Meeting of Governors.
16 Saturday

17 SUNDAY

18 Monday — Engineering Building Committee: Chemistry and Mining Building Committee.
19 Tuesday — No Lectures.
20 Wednesday
21 Thursday
22 Friday — Meeting of Faculty of Arts.
23 Saturday

24 SUNDAY

25 Monday — Physics and Engineering Buildings opened Feb. 25th, 1893.
26 Tuesday
27 Wednesday
28 Thursday

MARCH, 1901.

1 Friday	
2 Saturday	Meeting of Medical Faculty.
3 SUNDAY	
4 Monday	Meeting of Faculty of Applied Science.
5 Tuesday	
6 Wednesday	Meeting of Academic Board.
7 Thursday	
8 Friday	Meeting of Faculty of Arts.
9 Saturday	
10 SUNDAY	
11 Monday	
12 Tuesday	College Grounds Committee.
13 Wednesday	
14 Thursday	Finance Committee.
15 Friday	Meeting of Governors.
16 Saturday	
17 SUNDAY	
18 Monday	Engineering Building Committee: Chemistry and Mining Building Committee.
19 Tuesday	
20 Wednesday	
21 Thursday	
22 Friday	Meeting of Faculty of Arts. Reports of Attendance on Lectures. Winter term ends Faculty of Medicine.
23 Saturday	
24 SUNDAY	
25 Monday	
26 Tuesday	
27 Wednesday	
28 Thursday	Convocation for Degrees in Veterinary Science.
29 Friday	Last day of Lectures in Arts and Applied Science.
30 Saturday	
31 SUNDAY	

APRIL, 1901.

1 Monday	Examinations in Arts begin. Meeting of Faculty of Applied Science.
2 Tuesday	
3 Wednesday	Normal School Committee.
4 Thursday	Physics Building Committee.
5 Friday	Good Friday. Easter Vacation begins.
6 Saturday	Meeting of Medical Faculty.
7 SUNDAY	Easter Sunday.
8 Monday	Museum Committee: Library Committee.
9 Tuesday	Spring term begins, Faculty of Medicine. College Grounds Committee. Easter vacation ends.
10 Wednesday	Regular meeting of Corporation.
11 Thursday	Finance Committee.
12 Friday	
13 Saturday	
14 SUNDAY	
15 Monday	Engineering Building Committee: Chemistry and Mining Building Committee.
16 Tuesday	
17 Wednesday	
18 Thursday	
19 Friday	Meeting of Governors.
20 Saturday	
21 SUNDAY	
22 Monday	
23 Tuesday	
24 Wednesday	
25 Thursday	
26 Friday	
27 Saturday	
28 SUNDAY	
29 Monday	
30 Tuesday	Convocation for Degrees in Arts, Law and Applied Science. Graduate Course in Medicine begins

1 Wednesday	Meeting of Examiners for School Examinations.
2 Thursday	
3 Friday	
4 Saturday	Meeting of Medical Faculty.
5 SUNDAY	
6 Monday	Meeting of Faculty of Applied Science.
7 Tuesday	
8 Wednesday	
9 Thursday	Finance Committee.
10 Friday	
11 Saturday	
12 SUNDAY	
13 Monday	
14 Tuesday	College Grounds Committee.
15 Wednesday	
16 Thursday	
17 Friday	Meeting of Governors.
18 Saturday	
19 SUNDAY	
20 Monday	Engineering Building Committee : Chemistry and Mining Building Committee.
21 Tuesday	
22 Wednesday	
23 Thursday	Lectures end, Faculty of Medicine.
24 Friday	Queen's Birthday.
25 Saturday	
26 SUNDAY	Whit Sunday,
27 Monday	Examinations begin, Faculty of Medicine.
28 Tuesday	
29 Wednesday	
30 Thursday	
31 Friday	Normal School closes.

JUNE, 1901.

1 Saturday	Meeting of Medical Faculty.
2 SUNDAY	Trinity Sunday.
3 Monday	
4 Tuesday	
5 Wednesday	Normal School Committee.
6 Thursday	Physics Building Committee.
7 Friday	
8 Saturday	
9 SUNDAY	
10 Monday	Examinations begin for Matriculation and Associate in Arts. Museum Committee : Library Committee.
11 Tuesday	College Grounds Committee.
12 Wednesday	Regular Meeting of Corporation.
13 Thursday	Finance Committee.
14 Friday	Spring Term ends, Faculty of Medicine. Convocation for degrees in Medicine.
15 Saturday	
16 SUNDAY	
17 Monday	Engineering Building Committee : Chemistry and Mining Building Committee.
18 Tuesday	
19 Wednesday	
20 Thursday	
21 Friday	Meeting of Governors.
22 Saturday	
23 SUNDAY	
24 Monday	
25 Tuesday	
26 Wednesday.	
27 Thursday	
28 Friday	
29 Saturday	
30 SUNDAY	

1 Monday
2 Tuesday
3 Wednesday
4 Thursday
5 Friday
6 Saturday — Meeting of Medical Iaculty.
7 SUNDAY
8 Monday
9 Tuesday
10 Wednesday
11 Thursday
12 Friday
13 Saturday
14 SUNDAY
15 Monday
16 Tuesday
17 Wednesday
18 Thursday
19 Friday
20 Saturday
21 SUNDAY
22 Monday
23 Tuesday
24 Wednesday
25 Thursday
26 Friday
27 Saturday
28 SUNDAY
29 Monday
30 Tuesday
31 Wednesday

AUGUST, 1901.

1 Thursday
2 Friday
3 Saturday
4 SUNDAY
5 Monday
6 Tuesday
7 Wednesday
8 Thursday
9 Friday
10 Saturday
11 SUNDAY
12 Monday
13 Tuesday
14 Wednesday
15 Thursday
16 Friday
17 Saturday
18 SUNDAY
19 Monday
20 Tuesday
21 Wednesday
22 Thursday
23 Friday
24 Saturday — Peter Redpath Musaum opened 1882.
25 SUNDAY
26 Monday
27 Tuesday
28 Wednesday
29 Thursday
30 Friday
31 Saturday

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use of meteorological instruments and in astronomical work, is situate at the head of the University campus.

Meteorological observations.—Records of temperature, atmospheric pressure, wind velocity and direction, and sunshine are obtained by self-recording instruments. Check observations are made at 7,40 a.m., 3 p.m., and 7,40 p.m. on standard instruments.

The principal instruments employed are two standard mercurial barometers; one Richard barograph; one Richard thermograph, one Callendar thermograph; one Kew standard thermometer; two Pastorelli thermometers; one maximum thermometer; one minimum thermometer; one set of six self-recording thermometers, with controlling clock, battery, etc.; two anemometers; one wind vane; one anemograph with battery, etc.; one sunshine recorder; one rain-band spectroscope and one rain guage.

The Anemometer and Vane are on the summit of Mount Royal, at a point about three-quarters of a mile north-west of the Observatory. They are 57 feet above the surface of the ground and 810 feet above sea level.

Soil temperatures are observed, in co-operation with the Physical Laboratory, by means of platinum thermometers at depths ranging from one inch to nine feet.

The astronomical equipment consists of:—The Blackman Telescope (6¼ in.); a photoheliograph (4½ in.); a 3¼ in. transit with striding level, etc.; a prismatic (8cm.) transit instrument also arranged as a zenith telescope; a 2 in. transit in the prime vertical; two collimating telescopes; one sidereal clock; one mean time clock; one sidereal chronometer; one mean time chronometer; one chronograph; batteries, telegraph lines, and sundry minor instruments.

Observations for clock errors are made on nearly every clear night. Time exchanges are regularly made with the Toronto observatory. Time signals are distributed throughout the city by means of the noon time-ball, continuous clock-signals, and the fire-alarm bells; and to the country, through the telegraph lines.

The longitude of the Observatory was determined in 1892 by direct telegraph connection with Greenwich, with exchange of observers and instruments. The position is believed to be the most accurately determined in America.

Gymnasiums.

The University Gymnasium.

Medical Examiner and Instructor:—R. Tait McKenzie, B.A., M.D.

The classes, which are open to men Students of all the Faculties, will meet at the University Gymnasium at hours to suit, as far as

possible, the convenience of Students, and to be announced at the commencement of the Session.

The recent addition of some special apparatus enables the instructor to devote some attention to the application of exercise in treating special cases of weakness or deformity, which should be reported to him before the regular class work is undertaken.

THE WICKSTEED SILVER AND BRONZE MEDALS FOR PHYSICAL CULTURE (the gift of Dr. R. J. Wicksteed) are offered for competition to Students of the graduating class and to Students who have had instruction in the Gymnasium for two sessions; the silver medal to the former, the bronze medal to the latter.

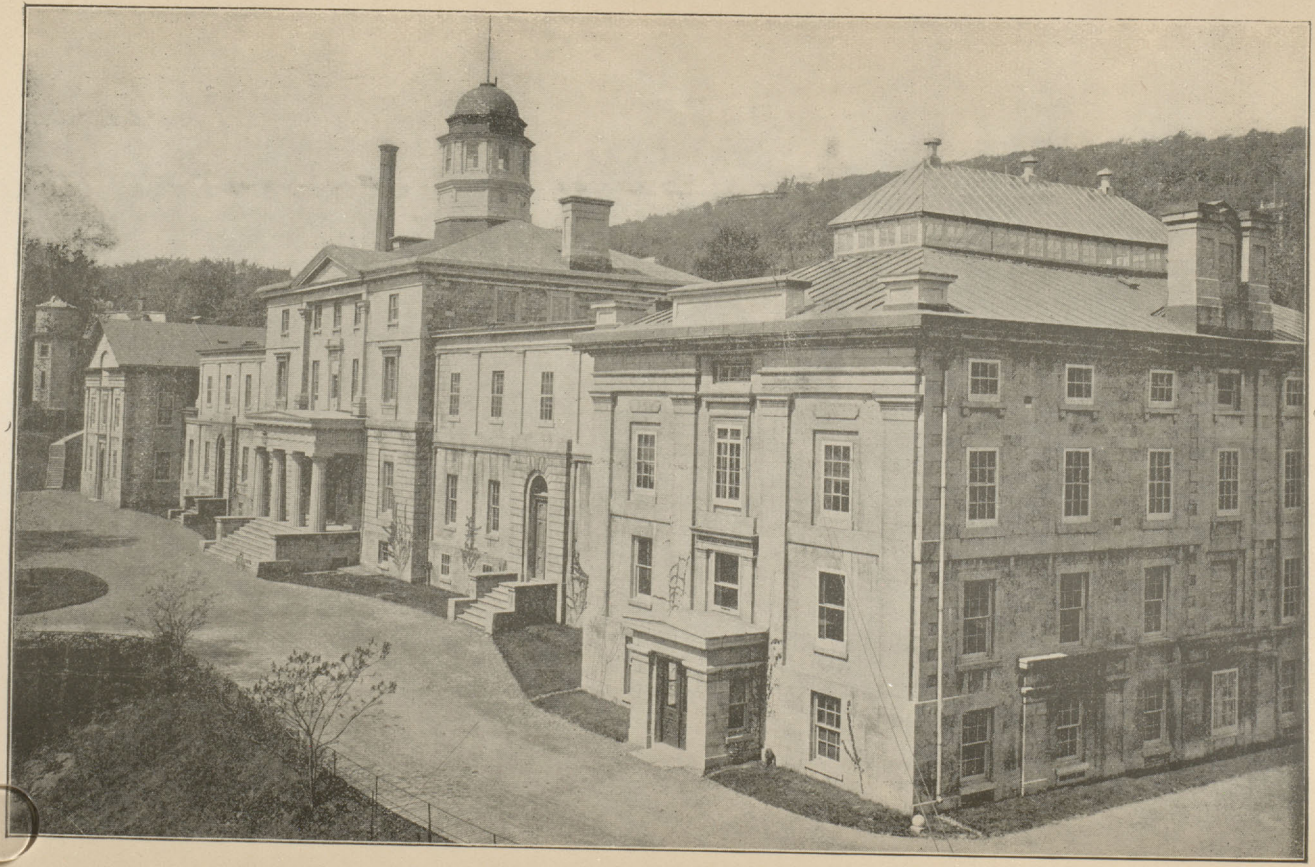
The award of these medals is made by Judges, appointed by the Corporation of the University.

Every competitor for the silver medal is required to lodge with the Judges, before the examination, a certificate of good standing in the graduating class signed by the Dean or Secretary of the Faculty to which he belongs, and the medal will not be awarded to any Student who may fail in his examination for the degree.

The Royal Victoria College Gymnasium.

Instructor:—MISS VENDLA M. HOLMSTROM.

Classes for Women Students are conducted in the newly equipped Gymnasium of the Royal Victoria College, see page 79.



Arts Building.

Faculty of Arts.

I. REGULATIONS FOR ENTRANCE.

See pp. 8-18.

II. SCHOLARSHIPS AND EXHIBITIONS.

General Regulations.

1. A Scholarship is tenable for *two* years; an Exhibition for *one* year.

2. Scholarships are open for competition to Students who have passed the University Intermediate Examination, provided that not more than three sessions have elapsed since their Matriculation; and also to Candidates who have obtained what the Faculty may deem equivalent standing in some other University, provided that application be made before the end of the Session preceding the examination.

3. Scholarships are divided into two classes:—(1) **Science Scholarships**; (2) **Classical and Modern Language Scholarships** The subjects of examination for each are as follows:—

Science Scholarships.—MATHEMATICS.—Differential and Integral Calculus; Analytic Geometry; Plain and Spherical Trigonometry; Higher Algebra and Theory of Equations. NATURAL SCIENCE—Botany; Chemistry; Logic. (For details, see p. 44.)

Classical and Modern Language Scholarships.– Greek, Latin, English Compositions; English Language and Literature; French or German. (For details, see p. 44.)

4. Exhibitions are assigned to the First and Second Years.

First Year Exhibitions are open for competition to candidates for entrance into the First Year.

Second Year Exhibitions are open for competition to Students who have passed the First Year Sessional Examinations, provided that not more than two sessions have elapsed since their Matriculation; and also for candidates for entrance into the Second Year.

The subjects for examination are as follows:—

First Year Exhibitions.—CLASSICS, MATHEMATICS, ENGLISH LANGUAGE AND LITERATURE, FRENCH, or GERMAN.

Second Year Exhibitions.—CLASSICS, MATHEMATICS, ENGLISH AND MODERN HISTORY, FRENCH or GERMAN.

5. The First and Second Year Exhibition Examinations will, for Candidates who have not previously entered the University, be regarded as Matriculation Examinations.

6. No student can hold more than one Exhibition or Scholarship at the same time.

7. Exhibitions and Scholarships will not necessarily be awarded to the candidates who have obtained the highest marks. An adequate standard of merit will be required.

8. If in any College Year there be not a sufficient number of candidates showing adequate merit, any one or more of the Exhibitions or Scholarships offered for competition may be given to more deserving candidates in another year.

9. A successful candidate must, in order to retain his Scholarship or Exhibition, proceed regularly with his College Course to the satisfaction of the Faculty.

10. The annual income of the Scholarships or Exhibitions will be paid in four instalments, viz.:—In October, December, February and April, about the 20th day of each month.

11. The Examinations will be held at the beginning of every session.

For the session of 1900-1901 there are thirty-five Scholarships and Exhibitions, including the following:—

The Jane Redpath Exhibition, founded by Mrs. Redpath, of Terrace Bank, Montreal:—value, about $90 yearly, open to both men and women.

The Macdonald Scholarships and Exhibitions, founded by Sir W. C. Macdonald, Montreal:—value $125 each, yearly.

The Charles Alexander Scholarship, founded by Charles Alexander, Esq., Montreal, for the encouragement of the study of Classics and other subjects:—value $90 yearly.

The George Hague Exhibition, given by George Hague, Esq., Montreal, for the encouragement of the study of Classics:—value $125 yearly.

The Major H. Mills Scholarship, founded by bequest of the late Major Hiram Mills:—value $100 yearly.

The Barbara Scott Scholarship, founded by the late Miss Barbara Scott, Montreal, for the encouragement of the study of the Classical languages and literature:—value, $100 to $120 yearly.

Two Donalda Exhibitions, open to women:—value $100 and $120 yearly.

One Donalda Scholarship:—value, $125 yearly.

Ottawa Valley Graduates' Society Exhibition, awarded on the results of the June Examination.

The Sir William Dawson Exhibition, given by the New York Graduates' Society:—value $60.

And fifteen others, ranging from $90 to $200 each.

First Year Exhibitions.

First Year Exhibitions.

The First Year Exhibition Examinations will be held at McGill College, Montreal; and also at any of the following centres, provided that application in writing be made to the Secretary of the Board of Matriculation Examiners by intending candidates not later than September 1st, viz.—

Toronto, Kingston and Ottawa, Ont.; Halifax, N.S.; St. John, N.B.; Charlottetown, P.E.I.; Winnipeg, Man.; Victoria and Vancouver, B.C.; St. John's, Nfld.

No application received after September 1st will be considered.

All the other Entrance, Exhibition and Scholarship Examinations of September, 1900, will be held at McGill College only.

Twenty-one Exhibitions will be offered for competition to Students entering the First Year in September, 1900, viz:—

Two of $200	each.	
Two of $200	"	open to women only, conditional on residence in the Royal Victoria College.*
Three of $150	"	
Five of $125	"	open to men only.
Two of $100	"	open to candidates offering a second Modern Language instead of Greek, see p. 42.
Three of $100	"	open to women only.*
Three of $100	"	open to women only, conditional on residence in the Royal Victoria College.*
One of $ 90	"	

[*One or more of these exhibitions may be given to candidates entering the Second Year. A modern Language may be substituted for Greek.]

The following are the requirements in the various subjects of examination:—

Latin.—A paper on Latin Grammar; Translation at sight from easy Latin authors; easy Latin Prose Composition; Translation from the following prescribed books:—

1900 (*a*) Cæsar, De Bello Gallico, I and II, *or* V and VI.
(*b*) Virgil, Aeneid I, *or* II, *or* V, *or* VI.
(*c*) Cicero, in Cat. III, IV, *or* Horace, Odes III, *or* Tacitus, Agricola.

1901 (*a*) Cæsar, De Bello Gallico, II and III.
(*b*) Virgil, Aeneid II.
(*c*) Horace, Odes I, *or* Cicero, in Cat. I, II.

1902 (*a*) Cæsar, De Bello Gallico, IV and V.
(*b*) Virgil, Aeneid II.
(*c*) Horace, Odes I, *or* Cicero, in Cat. III, IV.

Greek.—A paper on Greek Grammar; Translation at sight from easy Greek authors; easy Greek Prose Composition; Translation from the following prescribed books:—

1900 (*a*) Xenophon, Anabasis I, *or* II, *or* III, *or* Hellenica I.
(*b*) Homer, Odyssey XV.
(*c*) Euripides, Hecuba (Sidgwick's Scenes), *or* Homer, Iliad I *or* VI, or in lieu of (*b*) and (*c*) together, Sophocles, Ajax.

1901 (*a*) Xenophon, Anabasis I, *or* II.
(*b*) Homer, Odyssey XV.
(*c*) Euripides, Hecuba (Sidgwick's Scenes), *or* Homer, Iliad I, *or* VI.

1902 (*a*) Xenophon, Anabasis I, *or* II.
(*b*) Homer, Odyssey XVII.
(*c*) Euripides, Hecuba (Sidgwick's Scenes), *or* Homer, Iliad I, *or* VI.

In both Latin and Greek, candidates who do not offer the books prescribed above will have the option of an additional paper in Composition and Translation at Sight.

Text-books.—Sonnenschein's *or* Rutherford's Greek Grammar, *or* Burnet's Greek Rudiments, *or* White's First Greek Book; Abbott's Arnold's Greek Prose Composition; Sonnenschein's *or* Allen and Greenough's Latin Grammar; Arnold's Latin Prose Composition by Bradley, *or* Collar's Latin Composition, Pts. III and IV.

Mathematics.—*Euclid,* Bks. I, II, III, IV, with easy deductions; *Algebra,* as in Mathematics, Part I (p. 13), with the addition of the three Progressions; *Arithmetic.*

English.—*Grammar.*—An advanced knowledge of this subject will be required, and, in addition, some acquaintance with the historical development of English, as illustrated in common and important words. The candidate is recommended to read MASON'S *or* WEST'S Elements of English Grammar and expected to supplement Mason or West by using MORRIS'S Historical Outlines of English Accidence (Macmillan), as a book of reference. *Literature.*—The works to be read are those selected for the Matriculation Examination with the addition of MILTON'S L'Allegro and other short poems, ed. Bell (Macmillan), and the following essays of Macaulay:—Ranke's History of the Popes; Frederick the Great; with *either* Dumont's Recollections of Mirabeau, *or* the Essay on Clive. *Composition.*—The candidate will be required to write an essay on some subject connected with the literature prescribed.

French.—(*a*) Grammar, including Syntax; (*b*) Translation at sight of French into English; (*c*) Translation at sight of easy English prose passages into French; (*d*) Translation from the following texts:—

For 1900, PAILLERON, Le Monde où l'on s'ennuie; P. LOTI, Pages choisies (chez A. Colin, Paris); ABOUT, Le Roi des Montagnes; *or*, if one month's notice be given, candidates may substitute for the foregoing texts those prescribed for the Senior Matriculation Examination of the University of Toronto, *or* of Dalhousie University, and for the Leaving Examinations of Nova Scotia.

For 1901 and 1902, SARCEY, Le Siège de Paris (Heath & Co.); SANDEAU, Mademoiselle de la Seiglière (Heath & Co.); ABOUT, Le Roi des Montagnes (Heath & Co.); *or*, if one month's notice be given to the Secretary of the Board of Matriculation Examiners, candidates may substitute for the foregoing texts those prescribed for the Senior Matriculation Examination of the University of Toronto, *or*, of Dalhousie University, and for the Leaving Examinations of Nova Scotia.

or, instead of French:

German.—(*a*) Grammar, Accidence and Syntax (as much as is contained in JOYNES-MEISSNER or VAN DER SMISSEN); (*b*) Translation at sight from German into English; (*c*) Translation at sight into German of an easy passage of English prose; (*d*) Translation and grammatical study of the following texts:—

For 1900, JOYNES, German Reader; BAUMBACH, Der Schwiegersohn (Heath & Co.); BENEDIX, Plautus und Terenz, and Die Sonntagsjäger (Heath & Co.); AUERBACH, Brigitta (Ginn & Co.); For 1901 and 1902, SUDERMANN, Der Katzensteg (Heath & Co.); SCHILLER, Wilhelm Tell

(Macmillan & Co.); GERSTAECKER, Germelshausen (Heath & Co.); *or*, if one month's notice be given to the Secretary of the Board of Matriculation Examiners, candidates may substitute for the foregoing texts those prescribed for the Senior Matriculation Examination of the University of Toronto *or* of Dalhousie University, and for the Leaving Examinations of Nova Scotia.

The First Year Exhibitions will be awarded to the best candidates in the above subjects provided there be absolute merit.

But in subsequently distributing the Exhibitions of higher value among the successful candidates, work in the following subjects will be taken into account also:—

1. Higher Composition, and Translation at Sight (Latin and Greek).

2. Mathematics.—The remainder of the Additional Mathematics, (Part II); see p. 13.

3. English.—Henry Morley's First Sketch of English Literature, chaps. VII and VIII.

NOTE.—The First Year Exhibition Examination will be regarded as an Entrance Examination.

SPECIAL NOTICE FOR 1900-1901.

In 1900 two of the above Exhibitions, of $100 each, will be awarded to candidates who offer a second Modern Language in place of Greek. Such candidates will, in addition to the subjects mentioned in the Exhibition Circular already issued, and also above pp. 41, 42, be examined on (*a*) Higher Composition; (*b*) one of the two following lists of texts. Candidates are required to notify the Secretary of the Board of Matriculation Examiners, at least one month before the date of examination, in which language they intend to take the advanced paper.

French.—MOLIERE, Les Précieuses Ridicules; VICTOR HUGO, Les Misérables (Ginn & Co.); HALEVY, L'Abbé Constantin.

German.—FREYTAG, Soll und Haben (Ginn & Co.); BAUMBACH, Waldnovellen (Heath & Co.); GOETHE, Sessenheim (Heath & Co.).

Texts equivalent in difficulty to the foregoing will be accepted, if notice be given at least one month before the day of examination to the Secretary of the Board of Matriculation Examiners.

Macdonald Physics Building.

Second Year Exhibitions.

Nine Exhibitions will be offered to Students entering the Second Year, viz.: One of $140, six of $125, one of $100 (three of these being open to women) and one of $200, open to women only, conditional on residence in the Royal Victoria College.

Greek.—Luciani Vera Historia (Jerram); DEMOSTHENES, Olynthiacs I and II; EURIPIDES, Medea.

Latin.—VIRGIL, Georgics, Bk. I; HORACE, Odes, Bk. IV; LIVY, Bk. XXI.

Greek and Latin Prose Composition, and Translation at sight.

A paper on Grammar and History.

Text-books.—Meyers' Ancient History; Abbott's Arnold's Greek Prose Composition, *or* Sidgwick's First Greek Writer; Ramsay's Latin Prose, Vol. I.

Mathematics.—Euclid (six books); Casey's Sequel to Euclid; Algebra (HALL AND KNIGHT'S Advanced); Theory of Equations (in part); Trigonometry (as in ordinary course of First Year).

English and Modern History.—*Language.*—TRENCH, Study of Words. *Literature.*—SPENSER, Faerie Queene, Bk. I, ed. Percival (Macmillan); TENNYSON, Selections from Tennyson, ed. Rowe and Webb (Macmillan). *History.*—CHURCH, The Beginning of the Middle Ages (Epochs of Modern History, Longmans). *Composition.*—The candidate will be required to write an essay on some subject connected with the literature or history prescribed.

French. ((*a*) Grammar; (*b*) Translation at sight of an English passage into French; (*c*) brief French Composition on a prescribed subject; (*d*) a critical study of the following texts, tested by questions in the French language, to be answered in French:—

For 1900, V. HUGO, Ruy Blas; BALZAC, Les Chouans; MICHELET, Pages choisies (chez A. Colin, Paris); DAUDET, Jack.

Or, instead of French:—

German.—(*a*) German Grammar (an amount equal to JOYNES-MEISSNER, Accidence and Syntax); (*b*) Translation at sight from German into English, and of an easy English passage into German; (*c*) a critical study of Hermann and Dorothea, with the lives of Schiller and Goethe; (*d*) Translation from the following texts:—

For 1900, GOETHE, Hermann and Dorothea; HAUFF, Der Zwerg Nase (Heath & Co.); RIEHL, Der Fluch der Schönheit (Heath & Co.);

and BENEDIX, Die Hochzeitsreise (Heath & Co.); SCHILLER, Der Neffe als Onkel; BAUMBACH, Die Nonna (Heath & Co.).

No Candidate who has been placed in the Third Class in more than one subject can be awarded a Second Year Exhibition.

To Students Entering the Third Year, three Scholarships of $125 each, and two others of $100 and $90 are offered for Competition.

Scholarships Science. Two of these are offered in **Mathematics** and **Logic**, one of the two being for women only, and one in **Chemistry** and **Logic** (in 1900) or in **Biology** and **Logic** (in 1901.)

Mathematics.—Differential Calculus (WILLIAMSON, Chaps. 1, 2, 3, 4, 7, 9; Chap. 12, Arts. 168-183 inclusive; Chap. 17, Arts. 225-242 inclusive). Integral Calculus (WILLIAMSON), Chaps. 1, 2, 3, 4, 5; Chaps. 7, Arts. 126-140 inclusive; Chap. 8, Arts. 150-156 inclusive; Chap. 9, Arts. 168-176 inclusive. Analytic Geometry (SALMON), Conic Sections, subjects of chaps. 1-13 (omitting Chap. 8), with part of Chap. 14. LOCK, Higher Trigonometry; MCLELLAND and PRESTON, Spherical Trigonometry, Part I. SALMON, Modern Higher Algebra (first four chapters). TODHUNTER *or* BURNSIDE and PANTON, Theory of Equations (selected course).

Logic, as in Jevons' Elementary Lessons in Logic.

Chemistry.—Mendelieff, "The Principles of Chemistry." An Essay will be required on the Chemistry of Water and its Compounds.

Intending Candidates should consult the Professors of Chemistry with regard to the details of the chemical work.

Classics and Modern Languages. The two remaining Scholarships [viz., the Barbara Scott, $100 and the Charles Alexander $90] are offered in **Classics and Modern Languages:—**

Greek.—PLATO, Purves, Selections, pp. 1-21, 55-112 (Clarendon Press); THUCYDIDES, Book VI (Marchant, Macmillan); SOPHOCLES, Antigone (Jebb, Pitt Press; *or* Campbell and Abbott, Clarendon Press).

Prose Composition and Translation at Sight.

Latin.—HORACE, Epistles, Book I (Wilkins, Macmillan); CICERO, *Pro Plancio* (Auden, Macmillan); VIRGIL, Aeneid, Bk. VI (Sidgwick, Pitt Press), SALLUST, Catiline; CICERO, Select Letters (Abbott, Ginn & Co.).

Prose Composition and Translation at Sight.

Ancient History.—*Text-books.*—OMAN, History of Greece (Longmans); HOW and LEIGH, History of Rome to the Death of Cæsar (Longmans).

English and History.—*Literature.*—SHAKSPERE, Tempest, ed. Deighton (Macmillan); MILTON, Paradise Lost, Bks. I and II, ed. Macmillan (Macmillan); LAMB, Essays of Elia, ed. Hallward and Hill (Macmillan). *History.*—MYERS, Mediaeval and Modern History (Ginn), Part I. *Composition.*—The candidate will be required to write an essay on some subject connected with the literature or history prescribed. High marks will be given for this subject.

French.—(*a*) LANSON, Littérature française (18th and 19th Centuries); (*b*) Candidates will be questioned on the subject matter of the following texts, the lives of their authors, and the literary schools which they represent. The entire examination will be held in the French language:—

For 1900, V. HUGO, Préface de Cromwell; DE MUSSET, Les Nuits; DE VIGNY, Cinq Mars; MOLIERE, Le Misanthrope; RACINE, Britannicus.

Or, instead of French:—

German.—(*a*) German Grammar; (*b*) Translation at sight from English into German; (*c*) Critical study of the lives of Goethe and Schiller and of their works contained in the appended list; (*d*) Translation from the following texts:—

For 1900, SCHILLER, Die Braut Von Messina, Egmont's Leben und Tod (in Ginn & Co.'s edition of Goethe's Egmont), die Kraniche des Ibycus, Das Lied von der Glocke, Der Kampf mit dem Drachen; IMMERMANN, Der Oberhof (Wagner, Pitt Press); GOETHE, Egmont (Ginn & Co.); Dichtung und Wahrheit (Heath & Co.); MEYER, Gustav Adolf's Page (Heath & Co.).

III. REGULATIONS FOR DEGREES IN ARTS.

REGULATIONS FOR THE DEGREE OF B.A.

After passing the First Year Matriculation Examination, an Undergraduate, in order to obtain the Degree of B.A. or B.Sc., is required to attend regularly the appointed courses of lectures for four years, and to pass the required Examinations

in each year. He cannot proceed with his course unless he passes each Examination in its assigned order. Failure in the First or Second Year in more than two subjects, and in the Third Year in more than one, will entail the passing at the beginning of the following session, of a Supplemental Examination, which shall include *all* the subjects of the previous Sessional Examination. Failure in *one* subject at this Supplemental shall necessarily cause the loss of the session. Undergraduates are arranged in Years, from First to Fourth, according to their academic standing.

1. Ordinary Course for the Degree of B.A.

N.B.—The Arabic numerals refer to the numbering of the courses on pp. 66-106; *for example, Greek, 2, refers to the second course given under the head of Classical Literature and History, p.* 66.

First Year.

First Year.

Greek, 1, *or* **Latin, 1.**
English, 1A, 1B.
History, 1.
Mathematics, 1.
Latin, 1, *or* **Greek, 1,** *or* **French, 1, 2,** *or* **German, 1.**
Physics, 2.

French cannot be taken as a qualifying option in the First Year, except by students who have passed the Matriculation Examination in French.

A second Modern Language may be taken as an extra subject in the first three years. Credit will be given for it on application to the Faculty.

Advanced Sections.

With a view to the encouragement of higher work, **advanced sections** will be formed in all subjects as far as practicable, and in these Honours may be awarded. Permission to take an advanced section is granted by the professor.

Students taking the work of advanced sections may be excused from the work of the corresponding ordinary sections on the recommendation of the professor. No exemptions from other subjects will be granted to students in advanced sections.

Second Year.

Second Year.

English, 2A, 2B.
Latin, 2, *or* Greek, 2.

Any Three.
- Greek, 2, *or* Latin, 2, *or* French, 3, 4, *or* German, 2.
- Mathematics, 3A, including Dynamics, 3B, *or* Elementary Biology, 1, and Dynamics, 3B.
- Chemistry, 1, Laboratory work in addition.
- Logic and Psychology, 1.
- Hebrew, 1.

A second Modern Language may be taken as an extra subject in the first three years. Credit will be given for it on application to the Faculty.

Advanced Sections will be formed in the Second Year, as in the First.

Advanced Sections.

Third and Fourth Years.

(New Curriculum.)

The subjects of the Third and Fourth Years are arranged in the following divisions:—

LANGUAGE and LITERATURE.	HISTORY, PHILOSOPHY and LAW.	SCIENCE.
English, 3A *or* 3B; 3C.	History, 2.	Mathematics, 4.
Latin, 3, 4.	Logic and Metaphysics, 3.	Mechanics, Geometrical, 6A, 6B.
Greek, 3, 4.	Moral Philosophy, 2, 5, 6.	Optics, and Astronomy (2 half courses), 5A, 5B.
Sanskrit, 1A, 1B.	Political Science, 2.	Physics: Sound, Light, Heat (full course), 7A, 7B, 7C.
French, 5, 6.	Economics, 1.	Electricity and Magnetism (full course), 8.
German, 3, 4.	Roman Law, 1.	Chemistry, 2, 3, 5.
Semitic Languages, 2, 3.	Constitutional Law and History, 1, 2.	Zoology, 2.
Comparative Philology (half course), 1A, 1B.	Art (history of) and Archaeology, (2 half courses), 1.	Botany, 2, 3.
	History of Philosophy (half course), 4, 7.	Geology, 1.
		Physiology, Anatomy — *In the Faculty of Medicine.*

From the above divisions six courses are to be selected by each student in the Third and Fourth Years, three in each year.

Each will be studied in lecture courses extending over not more than four hours per week, with collateral reading, and, in the case of the science subjects, Laboratory work. One subject chosen in the Third Year *must* be continued by every student in his Fourth Year; two subjects *may* be continued if application to that effect be granted by the Faculty or the Advisory Committee of the Faculty. Of the whole six courses, one must be chosen by all candidates from the list of subjects (other than Mathematics) included under the head of Science, except in cases where Chemistry or Biology has been selected as an option in the Second Year.

In order to differentiate the B.A. curriculum from that laid down for the B.Sc. (Arts), candidates for B.A. are debarred from selecting more than three out of their six courses from the Science Division. Free options are allowed in all other cases (except as far as regards the selecting of at least one subject from the Science Division), subject to approval by the Faculty, or the Advisory Committee of the Faculty.

In addition to the six courses, a course of one hour a week in English Composition must be taken by every Undergraduate in the Third and Fourth Years.

*Fourth Year.

(Old Curriculum.)

Greek, 4,
Latin, 4 (Optional—instead of Greek).
Moral Philosophy, 5, 6.
Mathematical Physics, 6A. (Optional-instead of Astronomy).

(In addition to the above, the student wlll take one subject from Div. (a), as below, a second from Div. (b) and a third from either. Subjects together with their laboratory courses, viz.:—Botany, Zoology, Chemistry, Physics, Geology and Mineralogy, shall in each case count as two courses, except in the case of Candidates for Honours in these subjects.)

Div. a.

Greek, 4. If Latin has been taken.
Latin, 4. If Greek has been taken.
English Literature, 4.
French, 6. If Third Year French has been taken.
German, 4. If Third Year German has been taken.
Hebrew, 3.

*The subjects of the Fourth Year stand as in the old curriculum. They will be changed in 1901.

Div. b.

Astronomy and Optics, 5A, 5B. If Third Year Mathematical Physics has been taken.
Experimental Physics, 8.
Botany, 3.
Zoology (Special course for 1900-1901).
Geology, 1.

N.B.—Students claiming exemptions cannot count Astronomy with Optics, and Experimental Physics as subjects for the B.A. Examinations, unless they have taken the Mathematical Physics of the Third Year.

For details of each subject, see Courses of Lectures, p. 66 *et seqq.*

A Candidate who seeks to obtain an Ordinary B.A. Degree of the First Class must fulfil the following conditions: he must not only obtain the required aggregate of marks (viz., three-fourths of the maximum), but he must also obtain First Class standing in three of the departments, and not less than Second Class in the remainder.

Notes on the Ordinary Course for B.A.—[Old Curriculum.]

Additional Courses.

Fourth Year Students are not restricted to the choice of two distinct subjects in one of the above divisions. They may select one subject only, together with an additional course in the same subject, or in any other of the subjects which they have chosen, in which such Additional Course may be provided by the Faculty; the above rules, however, must be complied with, and Students must have been placed in the First Class in the corresponding subject at the preceding Sessional Examination, viz.:—Intermediate or Third Year, according to standing.

The Additional Course is intended to be more than equivalent, in the amount of work involved, to any of the other subjects in the Division.

(For details of Additional Courses provided, see pp. 51, 62; 66-106.)

Professional Students.

For arrangements enabling Students in Medicine or Applied Science to take the course in Arts also, and obtain B.A., with B.Sc. (Applied Science), or M.D., in six years, see pp. 57, 58.

2. Honour Courses.

Honours of First, Second, or Third Rank will be awarded to successful candidates in any Honour Course established by the Faculty, provided they have passed creditably the ordinary Examinations in all the subjects proper to their year.

No Undergraduate is permitted to attend the Honour lectures unless (*a*) he has been placed in the First Class in the subject at the preceding Sessional Examination, if there be one; (*b*) has satisfied the Professor that he is otherwise qualified; and (*c*) while attending lectures makes progress satisfactory to the Professor. In case his progress is not satisfactory, he may be notified by the Faculty to discontinue attendance.

A candidate for Honours must take the Ordinary Course in the subject in which he is reading for Honours.

Honour lectures are open to all Partial Students who can satisfy the Professor of their fitness to proceed with the work of the course. Such students will not be ranked with Undergraduates in the Examination lists.

No student is allowed to attend two Honour Courses without the special permission of the Faculty.

Candidates for Honours in the Third Year.

A Candidate for Honours in the Third Year, in order to obtain exemptions, must have taken a First Class at the Ordinary Sessional Examinations in the subject in which he proposes to compete for Honours, *or* a First or Second Class in the Advanced Section of that subject; must stand higher than Third Class in not less than half of the remaining subjects, and have no failure in any subject. In addition to the Ordinary subject specified above, he is required to take a second Ordinary subject, to be chosen from any division.

Candidates for B. A. Honours.

A student who has taken First or Second Rank Honours in the Third Year, and desires to be a Candidate for B.A. Honours, shall be required to attend two only of the courses of lectures given in the ordinary departments (but see note on Honour Biology, p. 52), and to pass the two corresponding examinations only, at the ordinary B.A. Examination. After 1901, a candidate for B.A. Honours is required to take only one subject in the Ordinary Course, viz., that in which he is reading for Honours. A Candidate, however, who at

the B.A. Examinations obtains Third Rank Honours, will not be allowed credit for these exemptions at the end of the Session, unless the examiners certify that his knowledge of the whole Honour Course is sufficient to justify it.

Note.—For subjects of Ordinary Course, see pp. 66-106.

Honour and Additional Courses.

Students who intend to graduate with Honours in any of the following Departments are strongly recommended to take the Advanced Sections of the Department in the First and Second Years, where such are provided.

(N.B.—The numbers which stand after the Academic years refer to the corresponding numbers of the Courses given on pp. 66-106.

1. Classical Literature and History.

THIRD YEAR HONOURS. Greek, 5.
Latin, 5.
FOURTH YEAR HONOURS. Greek, 6.
Latin, 6.

2. English Language and Literature.

THIRD YEAR HONOURS, p. 76.
FOURTH YEAR HONOURS. (*Old Curriculum*), p. 77.

3. History.

THIRD YEAR HONOURS, 3, 4.

Modern Languages: French and German.

4. French.

THIRD YEAR HONOURS,, 7 or 8; 9.

FOURTH YEAR HONOURS, 7 or 8; 9.

5. German.

THIRD YEAR HONOURS, 5 or 6; 7.
FOURTH YEAR HONOURS, 5 or 6; 7.

6. Semitic Languages.

THIRD YEAR HONOURS, 4*a* and 4*b*.
THIRD YEAR ADDITIONAL, 4*b* without Literature.
FOURTH YEAR HONOURS,, 5*a* and 5*b*.
FOURTH YEAR ADDITIONAL,5*b* without Literature.

7. Mental and Moral Philosophy.

THIRD YEAR HONOURS, 8.
FOURTH YEAR HONOURS, 9, 10.

8. Mathematics and Natural Philosophy.

THIRD YEAR HONOURS, 11, 12.
FOURTH YEAR HONOURS, 8, 13, 14.

9. Experimental Physics.

THIRD YEAR HONOURS, 7, 8, 9, 15.
FOURTH YEAR HONOURS, 16.

10. Geology and Mineralogy.

THIRD YEAR HONOURS, Mineralogy, 1, 3.
FOURTH YEAR HONOURS, Mineralogy, 2.
FOURTH YEAR HONOURS, Geology, 2, 3, 4, 5, 6.

11. Chemistry.

THIRD YEAR HONOURS, 3, 5.
FOURTH YEAR HONOURS, 4, 6.

Courses 2 (Second Year) and 7 (Fourth Year) are optional.

12. Biology.

THIRD YEAR HONOURS, Botany, 4. Zoology, 2, 3.

FOURTH YEAR HONOURS, { Botany, 5. Zoology, 4.

With the Honour Course in Biology only **one** *ordinary course is required.*

Students proceeding to Honours Biology in the Third and Fourth Years will take Chemistry and Biology in the Second Year, one half course of Organic Chemistry in the Third Year, and one half course of Geology in the Fourth Year.

3. Ordinary Course for the Degree of B.Sc. (Arts.)

First Year.

The English, French, German, Mathematics and Physics of the ordinary B.A. Course.

Second Year.

English two-thirds of the B.A. course in Second Year, p. 74.
Logic one-third of the B.A. course in Second Year, p. 89.
French; German; Chemistry; pp. 80, 83, 96.
Mathematics *or* **Botany of 3rd Year;** *or* **Zoology of 3rd Year.**

4. After passing the Intermediate examination, the candidate for a B. Sc. degree will specialize in the subjects enumerated under the "Science" group of options in the B. A. curriculum. His choice of subjects will be determined according as he may intend to follow mainly the line of mathematico-physical studies or physico-chemical or biological, or geological.

5. Examinations.

(A) College Examinations.

For Students of McGill College only.

1. There are two examinations in each year, viz., at Christmas and at the end of the Session. Successful students are arranged in three classes at the Sessional examinations.

Christmas Examinations will be held in all the subjects of the First and Second Year, and are obligatory on all Undergraduates, and also on all Partial Students intending to gain undergraduate standing. Candidates who fail in courses of the First and Second Years, terminating at Christmas, will be required to pass at the Sessional Examinations on an extra paper in the subject in which they have failed.

Christmas Examinations in the Third or Fourth Years may be held at the option of the Professors.

In the Fourth Year only, there is no Sessional Examination; the University Examination for B.A. or B.Sc. takes its place.

2. Undergraduates who fail in one subject at the Sessional Examinations of the First or of the Second Year are required to pass a Supplemental Examination therein in the following September. Should they fail in this Examination, they must in the following Session attend the Lectures and pass the Examination in the same subject, in addition to the regular course, or pass the Examination only, without attending Lectures, at the discretion of the Faculty.

3. Failure in two or more subjects at the Sessional Examinations of the First or of the Second Year, or in one subject at the Third Year Sessional Examinations, involves the loss of the Session. The Faculty may permit the student to recover his standing by passing a Supplemental Examination at the beginning of the following Session.

4. Examinations Supplemental to the Sessional Examinations will be held in September, simultaneously with the Matriculation Examinations.

5 A list of those to whom the Faculty may grant Supplemental Examinations in the following September will be published after the Sessional examination. The time for the Supplemental Examination will be fixed by the Faculty; the examination will not be granted at any other time, except by special permission of the Faculty, and on payment of a fee of $5.

(B) University Examinations.

I. For the Degree of B.A.

After passing the Matriculation Examination at entrance, candidates for the Degree of Bachelor of Arts must pass each of the four Sessional Examinations, including the Intermediate Examination at the end of the Second Year. Under the provisions of the new curriculum, the Third and Fourth Year Sessional Examinations constitute the Final.

1. Matriculation Examination– the subjects are stated on pp. 9-16.

2. Intermediate Examination—the subjects are as follows :

(a) **English** ;
(b) **Greek** *or* **Latin**;

Any three
- (c) **Latin** *or* **Greek** *or* **a Modern Language.**
- (d) **Mathematics, including Dynamics** *or* **Elementary Biology and Dynamics.**
- (e) **Chemistry.**
- (f) **Logic and Psychology.**
- (g) **Hebrew.**

English.—The course for the second year. See p. 74.

Greek.—THUCYDIDES "The Siege of Platæa" (Sing, Rivingtons), and "The Retreat from Syracuse" (Rouse, Rivingtons); HOMER, Odyssey IX (Edwards, Pitt Press); SOPHOCLES, Ajax (Jebb, Rivingtons *or* Campbell and Abbott, Clarendon Press); Prose Composition and Translation at sight of Greek (easy narrative) into English. General questions will also be set,—in History, on the Period of Athenian Supremacy, Cox's Athenian Empire, (Longmans' Epochs of Ancient History), with Abbott's Pericles (Putnams), and in Literature on the outlines as contained in Jebb's Primer of Greek Literature (pp. 1 to 100), (Macmillan), with QUINTILIAN, X, ch. 1, §§ 37-84.

A paper will also be set early in October on the Summer Readings, Luciani Vera Historia (Jerram, Clarendon Press): See p. 66.

Latin LIVY (Dimsdale, Pitt Press); QUINTILIAN X, ch. 1, §§ 37-131 (Peterson, Clarendon Press, smaller edition); HORACE, Wickham's Selected Odes (Clarendon Press); Latin Prose Composition and Translation at sight of Latin into English History; The last century of the Republic, B.C. 133-31; as in Beesley's "The Gracchi," "Marius and Sulla" (Longmans' Epoch Series), and "The Roman Triumvirates" (Merivale, Longmans' Epoch Series). Literature: Wilkins' Primer (Macmillan); with QUINTILIAN X, 1, §§ 37-131 (as above).

A paper will also be set early in October on the Summer Readings, Virgil Georgics I: See p. 70.

Mathematics—Arithmetic, Euclid, Books I., II., III., IV., VI. and defs. of Bk. V.—Algebra, including Quadratic equations;

the three Progressions; Ratio, Proportion and Variation; Permutations and Combinations; Scales of Notation; Logarithms; Interest and Annuities; Elements of Determinants; Geometrical Conic Sections.—Solid Geometry. (Euclid, Bk. XI., and first two Props. of Bk. XII. or equivalent); Spherical Trigonometry.

Dynamics—Projectiles; Impact; Simple Harmonic Motion; Simple and Compound Pendulum; Energy of Rotation.

Chemistry.—The course for the second year. See p. 96.

Logic and Psychology—The course for the second year. See p. 89.

Hebrew.—The course for the second year.

Final Examination

3. For the Final or B. A. Ordinary Examination (old curriculum) the subjects appointed are the obligatory subjects of the Third and Fourth Years, viz., Latin or Greek; Mathematical Physics (Mechanics and Hydrostatics, or Astronomy and Optics); Moral Philosophy; and those three subjects which the Candidate has selected in the Third and Fourth Years. (See p. 47.)

Greek.—PLATO, Protagoras; AESCHYLUS, Cheophoroi; Composition and Translation at Sight; paper on the Constitutional History of Athens, Greek Literature and Antiquities. A Paper will also be set *in October* on the Summer Readings,—Merriam's "The Phaeacians of Homer" (Harpers. See p. 68.)

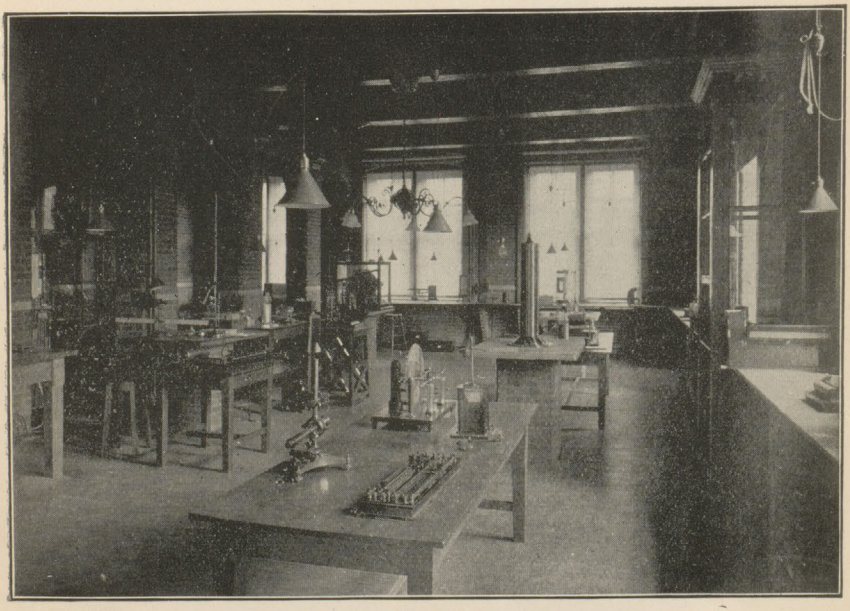
Latin.—LUCRETIUS, V. (Duff, Pitt Press); PLINY, Selected Letters (Westcott, Allyn and Bacon); TACITUS, Histories I. (Davies, Pitt Press). Composition and Translation at Sight. History of the Roman Empire to the reign of Domitian. A paper will also be set *in October* on the Summer Readings, Horace, Epistles II, with De Arte Poetica. See p. 71.

Mathematical Physic—Mechanics and Hydrostatics, as in LONEY'S Mechanics and Hydrostatics; or Optics and Astronomy, as in GALBRAITH and HAUGHTON or BRINKLEY.

Mental and Moral Philosophy—MURRAY'S Introduction to Ethics.

Natural Science.—(*a*) Mineralogy and Geology. See p. 102; *or* (*b*) Botany. See p. 100; *or* (*c*) Zoology. See p. 101; *or* (*d*) Practical Geology and Palaeontology (Additional). See p. 103; *or* (*e*) Practical Chemistry (Additional). See p. 97.

Macdonald Physics Building.—Departmental Library.



Macdonald Physics Building.—An Electrical Laboratory.

Experimental Physics—Electricity and Magnetism. (See courses of Lectures, p. 95.)

English Literature.—The course for the Fourth Year. See p. 75.

French.—The course for the Fourth Year. See p. 81.

German.—The course for the Fourth Year. See p. 84.

Hebrew.—Isaiah I to X; LIII; LV; Psalms LXVI to LXXI. Grammar, Syntax; Reading of the Masoretic notes, the Septuagint Version and the Vulgate. Translation at sight.

6. Regulations for Courses in Arts leading into the Professional Faculties.

Arts and Applied Science.

1. Undergraduates beginning the Third Year in Arts who have taken all the Ordinary Mathematics of the first two years, and the Chemistry of the Second Year, and who wish to pursue their professional studies in the Faculty of Applied Science so as to obtain the Degrees of B.A. and B.Sc. (App. Sc.) within the following four years, may be exempted by the Faculty of Applied Science from the Mathematics of the First Year in Applied Science and from the Chemistry of the Second Year.

2. They are allowed to distribute the course of the Third and Fourth Years in Arts over three years.

3. They may complete the Arts curriculum by taking the following courses:—

I. *In the Third Year:*—

(*a*) Physics of Third Year.

(*b*) Either one or two of the courses which are not placed under the heading "Science" in the Arts curriculum.

(*c*) Either one or two hours weekly in English Composition.*

II. *In the Fourth Year:*—

(*a*) Physics of Fourth Year.

(*b*) One of the courses which are not placed under the heading "Science" if only one has been taken in the Third Year.

(*c*) One hour weekly in English Composition, if only one has been taken in the Third Year.

**NOTE.—Students are recommended to distribute their English work over two years.*

(*a*) The Mathematics of the Second Year Applied Science (6 hours weekly as 1½ courses).

III. *In the Fifth Year:*—

The Mathematics of the Third Year Applied Science (2 hours weekly as a half course), or another course under the heading "Science" in the Arts curriculum.

Arts and Medicine.

1. Undergraduates beginning the Third Year, who have taken the Chemistry and Biology of the Second Year, and who wish to pursue their professional studies in the Faculty of Medicine so as to obtain the Degrees of B.A. and M.D. within the following four years, may be exempted by the Faculty of Medicine from the subjects of Chemistry and Physics, and Biology in the First Year of the Faculty of Medicine.

2. They may complete the Arts curriculum by taking the following courses:—

I. *In the Third Year:*—

(*a*) Anatomy and Practical Anatomy, Histology and Physiology, of First Year Medicine.

(*b*) Either one or two of the courses which are not placed under the heading "Science" in the Arts curriculum.

(*c*) Either one or two hours weekly in English Composition.*

II. *In the Fourth Year:*—

(*a*) Anatomy and Practical Anatomy, Histology, Physiology, Chemistry, of Second Year Medicine.

(*b*) One of the courses which are not placed under the heading "Science" if only one has been taken in the Third Year.

(*c*) One hour weekly in English Composition, if only one has been taken in the Third Year.*

Arts and Law.

Students intending to go forward to the Faculty of Law are recommended to include in their Third and Fourth Years Arts, such subjects as Constitutional Law and History, Economics, Political Science, and Roman Law.

**NOTE.*—*Students are recommended to distribute their English work over two years.*

Literate in Arts—A certificate of "LITERATE IN ARTS" will be given along with the professional degree in Medicine or Applied Science, to those who have completed two years' study in the Faculty of Arts, and have passed the prescribed examinations.

Students of the University attending affiliated Theological Colleges.

Affiliated Theological Colleges.

1. These students are subject to the regulations of the Faculty of Arts in the same manner as other students.

2. The Faculty will make formal reports to the governing body of the Theological College which such students may attend as to:—(1) their conduct and attendance on the classes of the Faculty; and (2) their standing in the several examinations; such reports to be furnished after the Examinations, if called for.

3. Students of affiliated Theological Colleges who are pursuing a double course in Arts and Divinity (six years at least) will take in the Third and Fourth Years the courses which constitute the ordinary curriculum in Arts, less a half course in each of these Years, or a whole course in either.

7. Medals, Prizes, Classing, and Certificates.

1. **Gold Medals** will be awarded in the B.A. Honour Examinations to Students who take the highest Honours of the First Rank in the subjects stated below, and who shall have passed creditably the Ordinary Examinations for the Degree of B.A., provided they have been recommended therefor to the Corporation by the Faculty on the report of the Examiners:—

The Henry Chapman Gold Medal for Classical Languages and Literature:

The Prince of Wales Gold Medal for Mental and Moral Philosophy.

The Anne Molson Gold Medal for Mathematics and Natural Philosophy.

The Shakspere Gold Medal for the English Language and Literature.

The Logan Gold Medal for Geology, Mineralogy and Palaeontology.

The Major Hiram Mills Gold Medal for a subject to be chosen by the Faculty from year to year.

In addition to the above, certain medals are offered annually by the **Alliance Française,** at the discretion of the Department of Modern Languages.

If there be no candidate for any Medal, or if none of the candidates fulfil the required conditions, the Medal will be withheld, and the proceeds of its endowment for the year may be devoted to prizes in the subject for which the Medal was intended. For details, see announcement of the several subjects below.

2. Special Certificates will be given to those Candidates for B.A. who have been placed in the First Class at the ordinary B.A. Examination ; have obtained three-fourths of the maximum marks in the aggregate of the studies proper to their year; are in the First Class in not less than half the subjects, and have no Third Class. At this examination, no Candidate who has taken exemptions (see pp. 57, 58) can be placed in the First Class unless he has obtained First Class in four of the departments in which he has been examined, and has no Third Class.

3. Certificates of High General Standing will be granted to those Undergraduates of the first two years who have obtained three-fourths of the maximum marks in the aggregate of the studies proper to their year, are placed in the First Class in not less than half the subjects, and have not more than one Third Class. In the Third Year the conditions are the same as for the Special Certificate for B.A.

4. Prizes or Certificates will be given to those Undergraduates who have distinguished themselves in the studies of a particular class, and have attended all the other classes proper to their year.

5. Graduates who attend lectures in any subject, and pass the corresponding Examinations therein, may obtain certificates of their standing, whether the course in question be Ordinary, Advanced or Honour.

6 His Excellency the Earl of Minto has been pleased to offer annually during his term of office a Gold Medal

for the study of Modern Languages and Literature, or for First Rank General Standing, as may be announced.

(*a*) The Regulations for the Gold Medal if awarded for Modern Languages and Literature are as follows:—

(1) The subjects for competition shall be the French and German languages and literatures.

(2) The course of study shall extend over two years, viz., the Third and Fourth Years.

(3) The successful Candidate must be capable of speaking and writing both languages correctly.

(4) There shall be examinations in the subjects of the course in both the Third and Fourth Years, at which Honours may be awarded to deserving Candidates.

(5) The general conditions of competition and the privileges as regards exemptions shall be the same as for the other Gold Medals in the Faculty of Arts.

(6) Students from other Faculties shall be allowed to compete, provided they pass the examinations of the Third and Fourth Years in the above subjects.

(7) Candidates desiring to enter the Third Year of the Course, who have not obtained first-class standing at the Intermediate or Sessional Examinations of the Second Year in Arts, are required to pass an examination in the work of the first two years of the Course in Modern Languages, if called on to do so by the Professors.

(8) The subjects of examination shall be those of the Honour Course in Modern Languages.

(*b*) The Regulations for the Gold Medal, if awarded for First Rank General Standing, are as follows:—

(1) The successful Candidate must take no exemptions or substitutions of any kind, whether Professional or Honour, in the Ordinary B.A. Examinations.

(2) He shall be examined in the following subjects:—

(*a*) CLASSICS (both languages); (*b*) MECHANICS, HYDROSTATICS, OPTICS, ASTRONOMY; (*c*) MORAL PHILOSOPHY; and any *two* of the following subjects, or any *one* of them with its Additional Course; (*d*) GEOLOGY, etc.; (*e*) EXPERIMENTAL PHYSICS; (*f*) ENGLISH; (*g*) FRENCH; (*h*) GERMAN.

(3) His answering must satisfy special conditions laid down by the Faculty.

(4) The same Candidate cannot obtain the Gold Medal for First Rank General Standing and also a Gold Medal for First Rank Honours.

6. The Neil Stewart Prize of $15 is open to all Undergraduates and Graduates of this University, and also to Graduates of any other University, who are students of Theology in some College affiliated to this University. The rules which govern the award of this prize are as follows:—

(1) The Candidate must pass, in the First Class, a thorough examination upon the following subjects: Hebrew Grammar; reading and translation at sight from the Pentateuch, and from such poetic portions of the Scriptures as may be determined.

(2) There will be two Examinations of three hours each—one in Grammar and the other in Translation and Analysis.

(Course for the present year: Hebrew Grammar (Gesenius; Translation and Analysis of Exodus; Isaiah XL. to the end of the book.)

(3) In case competitors should fail to attain the above standard, the prize will be withheld, and a prize of $30 will be offered in the following year for the same.

This Prize, founded by the late Rev. C. C. Stewart, M.A., and terminated by his death, was re-established by the liberality of the late Neil Stewart, Esq., of Vankleek Hill.

7. Early English Text Society's Prize.—This prize, the annual gift of the Early English Text Society, will be awarded for proficiency in the subjects of the language group in the English Honour curriculum of the Third and Fourth Years.

8. New Shakspere Society's Prize.—This Prize, the annual gift of the New Shakspere Society, open to Graduates and Undergraduates, will be awarded for a critical knowledge of the following plays of Shakspere:—

Hamlet; Macbeth; Othello; King Lear.

9. Charles G. Coster Memorial Prize.—This Prize, intended as a tribute to the memory of the late Rev. Chas. G. Coster, M.A., Ph.D., Principal of the Grammar School, St. John, N.B., is offered by Colin H. Livingstone, B.A., to Undergraduates (men or women) from the Maritime Provinces, Nova Scotia, New Brunswick and Prince Edward Is-

land. In April, 1901, it will be awarded to that Undergraduate of the First, Second or Third Year, from the above Provinces, who, in the opinion of the Faculty, has passed the most satisfactory Sessional Examinations, under certain conditions laid down by the donor.

10. **Annie McIntosh Prize.**—The income of the sum of $425, subscribed by the pupils and friends of the late Miss Annie M. McIntosh, will be offered as a prize to students of the Royal Victoria College in such subject or for such work as the Faculty may determine.

11. **Science Scholarships Granted by Her Majesty's Commission for the Exhibition of 1851.**— These scholarships of the value of £150 a year are tenable for two or, in rare instances, three years. They are limited, according to the Report of the Commission, "to those branches of Science (such as Physics, Mechanics and Chemistry) the extension of which is specially important for our national industries." Their object is not to facilitate ordinary collegiate studies, but "to enable students to continue the prosecution of science with the view of aiding in its advance or in its application to the industries of the country."

Four nominations to these scholarships have already been placed by the Commissioners in 1891, 1893, 1895 and 1897 at the disposal of McGill University, and have been awarded.

When nominations are offered, they are open to Students of not less than three years standing in the Faculty of Arts or of Applied Science, and are tenable at any University or at any other Institution approved by the Commission.

12. The names of those who have taken Honours, Certificates or Prizes will be published in order of merit, with mention, in the case of Students of the First and Second Years, of the schools in which their preliminary education has been received.

IV. SUMMER CLASSES.

During the months of May and June, a series of SUMMER CLASSES will be conducted, intended mainly in the first instance, to meet the requirements of students in the first two years of their course. The subjects offered are English, Latin, Greek, Mathematics, Logic, French, and German. A fee of ten dollars will be exigible for each course; or students may compound for any four courses by payment of an inclusive fee of twenty-five dollars.

V. FEES.

All fees and fines are payable to the Bursar.

The fees must be paid to the Bursar, and the receipts shown to the Dean within a fortnight after the commencement of attendance in each session. In case of default, the student's name will be removed from the College Books, and can be replaced thereon only by permission of the Faculty, and on payment of a fine of $2.

Undergraduates matriculated before May, 1898, and Partial Students who have entered the affiliated Theological Colleges before May, 1898, and are pursuing the curricula of such Colleges, are subject to the old scale of fees.

1. Undergraduates and Conditioned Students. — $61 per session. This will include the fee for Laboratory work, Library, Gymnasium and Athletics, and Graduation. In the Third and Fourth Years, it will cover the normal amount of practical instruction given in each subject having a Laboratory Course.

Matriculation fee for entrance into the Second Year, $10, in addition to the sessional fee.

2. Partial Students.—(First and Second Years.)—$16 per session for one course of lectures, including the use of the Library; $12 per session for each additional course. In addition there will be a fee of $3 for Athletics.

3. Partial Students.— (Third and Fourth Years)—$25 per session for one course of lectures, including the use of the Library and Athletics; $20 per session for each additional course.

N.B.—The lectures in one subject in any one of the four College years constitute a "Course."

Partial Students taking the full curriculum in any one year pay the same fees as Undergraduates in that year.

4. Graduates in Arts of this University are allowed, on payment of one-half of the usual fees, to attend all lectures, except those for which

a special fee is exigible. For Bachelors of Arts proceeding to M.A. by taking for one year a graduate course of study, the fee is $40. This will cover Laboratory work.

5. Caution Money.—Every student is required to deposit with the Bursar the sum of $5 as caution money for damage done to furniture, apparatus, books, etc.

Special Fees.

ELOCUTION (optional)	$5 00
GYMNASIUM (for partial students), optional	2 50
SUPPLEMENTAL EXAMINATION, at the regular date fixed by the Faculty	2 00
SUPPLEMENTAL EXAMINATION, when granted at any other time than the regular date fixed by the Faculty	5 00
CERTIFICATE OF STANDING, if granted to a student on application	1 00
CERTIFICATE OF STANDING, if accompanied by a statement of classification in the several subjects of examination	2 00

All applications for certificates must be addressed to the Registrar of the University, accompanied by the required fee.

No certificates are given for attendance on lectures unless the corresponding examinations have been passed.

In the Third and Fourth Years, under the old regulations, a special fee of ten dollars is charged for laboratory courses (optional) in Botany, Chemistry, Physics, and Zoology. A fee of five dollars is charged for the laboratory course (optional) in Petrography.

All fees for Supplemental Examinations must be paid to the Bursar, and the receipts shown to the Dean before the examination.

All fines are applied to the purchase of books for the Library.

VI. COURSES OF LECTURES.

Classical Literature and History.

Professors:—W. Peterson, M.A., LL.D.
Frank Carter, M.A.
Associate Professor:—A. J. Eaton, M.D., Ph.D.
Lecturers:—S. B. Slack, M.A.; H. N. Sanders, M.A.

In this department, the work of the first two years is divided mainly between exercise in Grammar and Composition and the read-

ing of selected authors. The attention of the student is at the same time directed to the collateral subjects of History, Literature, Antiquities, and Geography, in connection with which various text-books are recommended, as specified below.

In the Third and Fourth Years (as also in the Honour Courses) the instruction takes more of the lecture form, and an attempt is made to give a connected view of the leading branches of ancient literature, and the most important phases of ancient life and thought.

Students may be examined on the whole of the work prescribed for each class, even though it may not have been overtaken in lecture.

Subjects are suggested for Summer Readings in the various branches of class work. Students are strongly recommended to undertake these subjects during their long vacation, and credit will be given for them at an examination held in the first week of October.

Students are also recommended to devote some part of the vacation to the subjects set down under the heads of History and Literature, which will form part of the Sessional Examinations.

Greek.

Ordinary First Year.

1. In this class, besides a review of grammatical principles (Rutherford's Greek Grammar, Accidence), portions of some Greek authors—*e. g.*, XENOPHON, HOMER, HERODOTUS, LUCIAN and EURIPIDES—are read and explained.

For 1900-1901, the work will be Isocrates, ad Demonicum (Sandys, Rivingtons); Homer, Odyssey XXI (Edwards, Pitt Press); Euripides, Heracleidae (Beck and Headlam, Pitt Press). For *Composition*, the manual used will be North & Hillard's Greek Prose Composition (Rivingtons); for *Translation at Sight*, written and oral, Turner's Latin and Greek Passages (Longmans).

History.—From B. C. 560 to 479, Cox's "Greeks and Persians" (Longmans' Epoch Series).

Four hours a week.

Second Year.

2. The work of the Second Year will be selected mainly from the Greek Dramatists, and from THUCYDIDES, PLATO or DEMOSTHENES.

Subjects for 1900-1901:—

SUMMER READINGS.—Luciani Vera Historia (Jerram, Clarendon Press). Students are also recommended to work through some portion of Burnet's Greek Rudiments (Longmans).

SESSIONAL LECTURES.—Thucydides, "The Siege of Plataea" (Sing, Rivingtons) and "The Retreat from Syracuse" (Rouse, Rivingtons); Homer, Odyssey IX (Edwards, Pitt Press); Sophocles, Ajax (Jebb, Rivingtons, or Campbell & Abbott, Clarendon Press). The practice

of *Composition and Translation at Sight* will be continued as before; North & Hillard's Greek Prose Composition (Rivingtons), and Jerram's Anglice Reddenda (First Series).

HISTORY.—The Athenian Supremacy; Cox's "Athenian Empire" (Longmans' Epoch Series), with Abbott's "Pericles" (Putnam).

LITERATURE.—Outlines as contained in Jebb's Primer of Greek Literature, pp. 1-100, with Quintilian X, ch. 1. §§ 37-84.

Four hours a week.

The following books are recommended for general use during the first two years of the course:—Jebb's Introduction to Homer (Maclehose); Jebb's Primer of Greek Literature, supplemented by readings in Murray, Jevons or Mahaffy; Gow's Companion to School Classics (in part); Oman's History of Greece (Longmans); Mahaffy's Primer of Greek Antiquities; and Tozer's Primer of Classical Geography (Macmillan); Rutherford's Greek Grammar (Accidence and Syntax); or Sonnenschein's (Parallel Grammar Series), or Burnet's Greek Rudiments.

Students should provide themselves also with Kiepert's Atlas Antiquus.

Third Year.

3. In the Session 1900-1901, the provisions of the new curriculum come into operation for the Third Year. Under these Greek is one of the subjects which may be offered as one of the six courses during the Third and Fourth Years together. The increased time which will thus be given to it will make it possible to add to the reading of selected authors, and the practice of Composition and Translation at Sight, short courses of lectures on subjects of general interest in the departments of History, Philosophy, Literature, Art and Antiquities. Where possible, these will be illustrated by lantern-slides, or such other means as may be convenient. One fourth of the whole time of the Class (*i.e.*, one hour a week) will be devoted to such lecture-courses.

For the Session 1900-1901, the course will be as follows:—

a. SUMMER READINGS.—SOPHOCLES, Antigone (Jebb, Pitt Press, or Campbell & Abbott, Clarendon Press).

b. HISTORY, LITERATURE, ART AND ANTIQUITIES.—Courses will be delivered on two of the following three:—

(1) Early Greece—12 Lectures.
(2) An outline sketch of Greek Literature—12 Lectures
(3) Greek Life in the time of Pericles—12 Lectures

c. AUTHORS.—HERODOTUS VIII (Shuckburgh, Pitt Press); AESCHYLUS, Cheophoroi (Sidgwick, Clarendon Press); PLATO, Protagora (Adam, Pitt Press).

d. For practice in *Composition*, Sidgwick's Introduction to Greek Prose will be used for *Translation at Sight*, Tod and Longworth, Passages for Unseen Translation (Longmans).
Four hours a week.

4. Subjects for 1900-1901:—

Fourth Year.

SUMMER READINGS.—Merriam's "The Phaeacians of Homer" (Harpers).

SESSIONAL LECTURES.—Plato, Protagoras (Adam, Pitt Press); Aeschylus, Choephoroi (Sidgwick, Clarendon Press). *Composition and Translation at Sight* as in the Third Year.

HISTORY and LITERATURE.—The Constitutional History of Athens, with a general study of Greek Antiquities and Literature.
Two hours a week.

The following books are recommended for general use: Gow's Companion to School Classics (Macmillan); Jebb's Growth and Influence of Classical Greek Poetry (Macmillan); Campbell's Guide to Greek Tragedy (Percival); Abbott's Pericles (Putnam); Haigh's The Attic Theatre (Clarendon Press); Cornish's Concise Dictionary of Greek and Roman Antiquities (Murray); Jevons' or Mahaffy's or Murray's History of Greek Literature; Kiepert's Manual of Ancient Geography (Macmillan); Greenidge's Constitutional History; King & Cookson's Comparative Grammar (Clarendon Press).

Honours.

Third and Fourth Years.

5. The work of the Honours Classes in Greek has been so arranged as to admit of separate courses of lectures being given, with illustrative readings, along certain main lines of literary study, in addition to supplementary work as provided for below. In 1900-1901, the Lecture courses will be as under, the books selected for class reading being specified under each separate head:—

A. Lyric Poetry: PINDAR (Seymour's Selections, Ginn & Co.).

B. Oratory: DEMOSTHENES De Falsa Legatione (Shilleto, Deighton, Bell & Co.).

C. Drama; EURIPIDES Bacchae (Tyrrell, Macmillan).

Three hours a week.

Translation at Sight.—Fox & Bromley's Models and Exercises (Clarendon Press).

Prose Composition.—Sidgwick, and from Dictation.

Seminary Work.—Essays and Lectures on History, Literature, Comparative Philology and Ancient Philosophy.

Third Year.

Private Reading.—Plato, Purves's Selections, 1-21, and 55 to 112 (Clarendon Press); Thucydides VI (Marchant, Macmillan); Sophocles, Antigone (Jebb, Pitt Press; or Campbell & Abbott, Clarendon Press).

In *History* the examination will be directed to testing a general knowledge of the course of Greek History to the death of Alexander, and a more minute knowledge of the development of the Athenian Constitution and the period of Athenian Supremacy. In *Literature*, a general knowledge will be expected of the course of Greek literature, and a more minute knowledge of the lives and writings of the authors prescribed.

Fourth Year.

6. *Private Reading.*—SOPHOCLES, Trachiniæ (Jebb, Cambridge Press); HERODOTUS, Book VII (Butler, Macmillan); ARISTOPHANES, Frogs (Merry, Clarendon Press); Attic Orators (Jebb's Selections, Macmillan); ARISTOTLE, Ethics I, II, and X (Bywater, Oxford); THEOCRITUS, I, II, IV, XI, XV (Kynaston, Clarendon Press).

History, Literature and Antiquities.—Oman, Synonds, Murray; Jebb's Growth and Influence of Classical Greek Poetry; Leaf's Companion to the Iliad; Butcher's Aspects of the Greek Genius; Mahaffy's Social Life in Greece; Jebb's Attic Orators.

Grammar and Philology.—Goodwin's Greek Moods and Tenses, and Giles's Short Manual of Philology (Macmillan); Monro's Homeric Grammar (Clarendon Press).

BRITISH SCHOOL OF CLASSICAL STUDIES AT ATHENS.

This University is a contributor to the support of the above School, which affords facilities for archaeological and classical investigation, and study in Greece. Graduates in Arts of McGill University are accordingly entitled to special privileges and advantages as regards tuition in the School.

Latin.

Ordinary First. Year.

1. In this class, besides a general review of grammatical principles (Sonnenschein's Latin Grammar; Parallel Grammar Series)—portions of some Latin author, such as OVID, TIBULLUS, LIVY, SALLUST, VIRGIL, HORACE or CICERO—are read and explained.

For 1900-1901, the subjects will be OVID, Fasti VI, Sidgwick, Pitt Press); HORACE, Selections from Satires and Epistles (Baker, Macmillan); SALLUST, Catiline (Cook, Macmillan). For practice *Composition*, both written and oral, the text-book in use during the first two years will be North and Hillard's Latin Prose Composition (Rivingtons); and for *Translation at Sight*, Turner's Latin and Greek Passages (Longmans). *History.*—Carthaginian Wars, B. C., 263-146; Shuckburgh's History of Rome, or "Rome and Carthage" (Longmans' Epoch Series).

Four hours a week.

Second Year.

2. For 1900-1901, the subjects will be:—

SUMMER READINGS.—VIRGIL, Georgics I (Sidgwick).

Students are also recommended to continue the practice of Prose Composition (North and Hillard).

SESSIONAL LECTURES.—LIVY xxii (Dimsdale, Pitt Press); HORACE, Wickham's Selected Odes (Clarendon Press); QUINTILIAN X, ch. I, sections 37-131, being Quintilian's Review of Ancient Literature (Peterson, Clarendon Press, smaller edition). *Composition and Translation at Sight,* North & Hillard's Latin Prose Composition (Rivingtons); and Jerram's Anglice Reddenda (First Series).

HISTORY.—The last Century of the Republic, B. C., 133-31; as in Beesly's "The Gracchi, Marius and Sulla" (Longmans' Epoch Series), and "The Roman Triumvirates" (Merivale, Longmans' Epoch Series).

LITERATURE.—As in Quintilian X., chap. 1, §§ 37-131 (as above).

Four hours a week.

The following books are recommended for general use during the first two years of the course; Shuckburgh's History of Rome (Macmillan); Strachan-Davidson's CICERO and Warde-Fowler's CÆSAR (Putnam); Wilkins' Primer of Roman Literature, Wilkins' Primer of Roman Antiquities; Latin Grammar, Gildersleeve and Lodge.

Students should provide themselves also with Kiepert's Atlas Antiquus.

Third Year.

3. In the Session 1900-1901, the provisions of the new Curriculum come into operation for the Third Year. Under these, Latin is one of the subjects which may be offered as one of six courses, during the Third and Fourth Years together. The increased time which will thus be given to it will make it possible to add to the reading of selected authors and the practice of Composition and Translation at Sight short courses of lectures on subjects of general interest in the departments of History, Philosophy, Literature, Art and Antiquities. Where possible, these will be illustrated by lantern-slides, or such other means as may be convenient. One-fourth of the whole time of the Class (*i.e.*, one hour a week) will be devoted to such lecture-courses.

For the Session 1900-1901, the course will be as follows:—

A. SUMMER READINGS.—VIRGIL, Aeneid VI (Sidgwick, Pitt Press).

B. HISTORY, LITERATURE AND ANTIQUITIES.—Courses will be delivered on at least two of the following three subjects:—

(1) Roman Life and Character—12 Lectures.

(2) The Last Century of the Republic—12 Lectures

(3) An outline sketch of Latin Literature to the end of the Republic.—12 Lectures.

C. AUTHORS:—PROPERTIUS ii and iii (Postgate, Macmillan); PLINY, Selected Letters (Westcott, Allyn and Bacon); TACITUS, Histories i (Davies, Pitt Press); LUCRETIUS v (Duff, Pitt Press).

D. For practice in *Composition*, Sargent's Easy Latin Prose Exercises (Clarendon Press), and from dictation; and for *Translation at Sight*, Tod and Longworth, Passages for Unseen Translation (Longmans).

Four hours a week.

4. Subjects for 1900-1901:— **Fourth Year.**

SUMMER READINGS.—HORACE, Epistles II, with De Arte Poetica (Wilkins, Macmillan).

SESSIONAL LECTURES.—PLINY, Selected Letters (Westcott, Allyn and Bacon); TACITUS, Histories I (Davies, Pitt Press); LUCRETIUS, V (Duff, Pitt Press).

HISTORY.—Capes' "Early Roman Empire" (Longmans' Epoch Series); or Bury's History (John Murray), down to Domitian.

Two hours a week.

NOTE.—The following books are recommended for general use: Gow's Companion to School Classics (Macmillan); Mackail's Latin Literature (Murray); How & Leigh's History of Rome (Longmans); Pelham's Outlines of Roman History (Percival); Capes' Early Roman Empire (Longmans' Epoch Series); Cornish's Concise Dictionary of Greek and Roman Antiquities (Murray); Kiepert's Manual of Ancient Geography (Macmillan); Bennett's Appendix to Latin Grammar.

Honours. Third and Fourth Years.

5. As in Greek, the work of the Honours Classes in Latin has been so arranged as to admit of separate courses of lectures being given, with illustrative readings, along certain main lines of literary study, in addition to supplementary work as provided for below. In 1900-1901, the Lecture Courses will be as under, the books selected for class reading being specified under each separate head:—

A. Epic Poetry: VIRGIL, Aeneid I-III (Sidgwick, Pitt Press); LUCAN, Pharsalia, I (Heitland & Haskins, Pitt Press); STATIUS, Thebais X.

B. History: LIVY, Book I (Seeley, Clarendon Press); TACITUS, Annals, I-IV (Furneaux, Clarendon Press).

C. Lyric and Elegiac Poetry: HORACE, Odes i and iii (Gow, Pitt Press); MARTIAL (Selected Epigrams, Stephenson, Macmillan).

Translation at Sight.—Fox & Bromley's Models and Exercises (Clarendon Press). *Prose Composition.*—Selected Passages.

Seminary Work.—Essays and Lectures on History, Literature, Comparative Philology and Ancient Philosophy.

Private Reading.—HORACE, Epistles I (Wilkins, Macmillan); CICERO, Pro Plancio (Auden, Macmillan); VIRGIL, Aeneid vi (Sidgwick, Pitt Press); SALLUST, Catiline (Cook, Macmil'an); CICERO, Select Letters (Abbott, Ginn & Co.).

History.—A general knowledge of Roman History to the end of the First Century A. D., and a more minute knowledge of the period from B. C. 146 to the Death of Augustus.

Third Year.

Literature.—A general knowledge will be expected of the course of Roman Literature, and a more minute knowledge of the lives and writings of the authors prescribed.

6. *Private Reading.*—PLAUTUS, Rudens (Sonnenschein, Clarendon Press); CICERO, Tusculan Disputations I, II, and pro Milone (Clark, Clarendon Press); TERENCE, Hauton Timorumenos (Gray, Pitt Press); MERRY'S Fragments of Early Latin Poetry (Clarendon Press); QUINTILIAN, Book X (Peterson, Clarendon Press).

History, Literature and Antiquities.—How & Leigh's History of Rome (Longmans); Tyrrel's Latin Poetry; Students' Companion to Latin Authors (Middleton & Mills, Macmillan).

Fourth Year.

Grammar and Philology.—Lindsay's Short Historical Latin Grammar (Clarendon Press) and Giles's Short Manual of Philology (Macmillan); Lindsay's Textual Emendation (Macmillan).

Sanskrit.

Lecturer:—Henry Nevill Sanders, M.A.

Last session a course in Elementary Sanskrit was inaugurated with some degree of success, the course being a voluntary one that was not intended to count toward the Final Examination work. This year it is intended to offer two courses in Sanskrit, open to students who have passed the Intermediate Examination, although other students may obtain special permission to attend.

These courses comprise:—

1. A.—For beginners, the work mainly consisting in the mastering of the elements of Sanskrit Grammar, with such composition as tends to fix in the mind the knowledge thus acquired. Etymological references will be frequently made, that the true position of Sanskrit in its relation to other languages may be early impressed on the student. As progress is made, Reading in Sanskrit will be substituted for part of the composition. This course is to count as a half course qualifying for the degree.

Two hours a week.

Macdonald Chemistry and Mining Building.

1. B.—For those students who have already passed through Course A or its equivalent in Sanskrit preparation, four hours per week, one hour weekly, it is expected, will be devoted to lectures on Indian Literature and Civilization; two hours to Reading; one hour to Grammar and Composition bearing especially on the texts read. While insistence is laid throughout the course on the Etymological features of the language, students are urgently requested to take advantage of the special course on Philology (one hour per week) which may be substituted for one hour in Sanskrit Reading. Course B counts one full course to the Final; Courses A and B together, one and one-half, the student taking up Course B, not being debarred thereby from repeating a course in another department.

Books required: Perry Sanskrit Primer (Ginn & Co.); Whitney's Sanskrit Grammar (Ginn & Co.); Lanman's Sanskrit Reader (Ginn & Co.).

Four hours a week.

Comparative Philology.

Lecturers:— { **Dr. Eaton.** / **Mr. Slack.**

1. A.—Introductory Course:—25 Lectures.

This course, as forming a working basis for subsequent study of some one or more of the Indo-European languages, open to all students of the Third and Fourth Years.

The lectures will deal with the nature of phonetic change, its causes and results; Morphology and historical Etymology—the study of comparative inflexions of case, personal endings, etc.—and the main principles of syntactical relations.

As an introductory course, treating of the life and growth of language, the history, development and classification of languages, it will be adapted to the needs of any who may wish for an introduction to the study of languages. Careful discrimination will be exercised in adapting the study to the special needs of the students who elect the course, and the various theories will be presented in their most prominent and practical features.

B. Comparative Grammar of Greek and Latin.—25 lectures.

This course will deal more exclusively with the history and structure of these languages and their relation to the other members of the group.

It is primarily intended for Honour students in the Classics, and for such others as may be found to be qualified.

English Language and Literature.

Professor:—Chas E. Moyse, B.A.
Lecturer in English and Rhetoric:—P. T. Lafleur, M.A.
Special Lecturer:—J. W. Cunliffe, D.Lit.

Ordinary First Year

1. A. English Literature and Composition.—A course of lectures, chiefly synthetical, on the principles of English composition, with special reference to the use of words and the construction of sentences and paragraphs. Regular essays are required of all students. One hour a week.

1. B.—Studies of authors and masterpieces of English literature in a course of about twenty-five lectures. For 1900-1901, the subject will be the leading prose Essayists of England from Bacon to Goldsmith. The treatment is critical rather than biographical, the intention being to explain the origin and growth of essay writing as a characteristic form of modern literary expression, together with the causes which have assisted in permanently establishing its popularity. Incidentally, this course proves ancillary to (*A*) through the opportunity which it offers of discussing analytically the style of the authors under examination. One hour a week.

Second Year.

2 (A) History of Elizabethan Literature.—The political, social, and literary conditions of Elizabethan England will be noticed, and illustrated by a brief study of the life and works of Sir Philip Sidney. Special attention will be given to Spenser's minor poems, and the general plan and sibnificance of The Faerie Queene will be indicated. A sketch of the development of the English drama will follow, with a short account of the predecessors of Shakspere. The remainder of the course will be devoted to an introduction to Shakspearean study and criticism. Students are recommended to read as many of the plays as they can, especially Love's Labour's Lost, A Midsummer Night's Dream, Romeo and Juliet, Henry V, As You Like It, Hamlet, King Lear, and The Tempest. Lantern slides will be shown giving portraits of the chief personages, and illustrating the manners and customs of the time.

Fortnightly essays will be required on subjects set in connection with the lectures, and will be taken into account in determining the standing of students at the end of the session.

Two hours a week.

Second Year.

2 (B) History of the English Language.—Lectures will be given on the origin of English and its relation to other languages. While the method of treatment will be historical rather than philological,

the course will aim at making the student acquainted with the leading features of English at the main stages of its development. One hour a week.

The Second Year courses of lectures will be delivered during the Session 1900-1901, *by J. W. Cunliffe, D. Lit. (Lond.)*

Third and Fourth Years, (New Curriculum.)

The work of the Third and Fourth Years in English will consist of 3 (A) a course in Anglo-Saxon and Early English, and 3 (B) a course on the leading poets of the nineteenth century. These courses will be given in alternate years. Four hours a week.

In addition to 3(A) and 3 (B), there will be a course 3 (C) in English Composition, which all Third and Fourth Year undergraduates in the Faculty of Arts are required to take. One hour a week.

During the Session of 1900-1901 courses 3 (A) and 3 (C) will be given. 3 (A), ANGLO-SAXON AND EARLY ENGLISH.—First Term Anglo-Saxon. *Text-Books:* SWEET, Anglo-Saxon Primer; Anglo-Saxon Reader. Four hours a week.

Second Term Anglo-Saxon.—*Text-Books* as above. Two hours a week. MORRIS and SKEAT, Specimens of Early English, Part II (Selections); CHAUCER, Prologue to Canterbury Tales, Knightes Tale; ((Morris and Skeat, Clarendon Press), Parlement of Foules; Skeat, Minor Poems of Chaucer, Clarendon Press). Two hours a week.

There will be a series of demonstrations in which various details of literature and aspects of life in the period under investigation will be illustrated by lantern slides.

3 (C) ENGLISH COMPOSITION.—An advanced course on English Composition, including style, methods and principles of literary criticism treated from the historical point of view, and an introduction to the comparative study of literature in accordance with the most recent results of contemporary thought and research. In connection with this course students will be examined in a course of prescribed readings. Essays at stated periods are required of all.

During the Session 1901-1902, courses 3 (B) and 3 (C), as indicated above, will be given. The details of 3 (B) will be stated in next year's Calendar.

Fourth Year, (Old Curriculum.)

4. A course on the LEADING POETS OF THE NINETEENTH CENTURY. The chief aspects of the French Revolution will be considered, and Republican feeling in England illustrated, chiefly from the works of WORDSWORTH, COLERIDGE and SOUTHEY. The indirect revolutionary poets BYRON and SHELLEY will then be considered, and their typical poems, together with those of the poets already mentioned, critically examined. The remainder of the course will be given to SCOTT.

KEATS, TENNYSON, BROWNING and SWINBURNE.—*In the course for 1900-1901, special attention will be given to Tennyson and Browning.* One hour a week.

The following poems have been selected for private reading. A paper will be set on them at the sessional examination of the Fourth Year:

WORDSWORTH:—The Scholars of the Village School of——; Two April Mornings; The Fountain; The Peak of Weatherlam, in the Prelude—("One summer evening (led by her) I found," Book I); Lucy Poems; Earth has not anything——; Hart-leap Well; Tables Turned; Lines written in early spring; To my Sister; Excursion—The Vision in the Skies. (So was he lifted gently from the ground) Book II; The Child and the Shell, (I have seen a curious child), (Book IV), Laodamia; It is a beauteous evening; The world is too much with us; Scorn not the Sonnet; Milton, thou shouldst——; Daffodils; The Yarrow Poems.

COLERIDGE:—Dejection; Ode to France; Lines to a Gentleman, composed on the Night after his Recitation of a Poem on the Growth of an Individual Mind; Love; Youth and Age; Fancy in Nubibus; Christabel; Hymn before sunrise in Vale of Chamouni.

SOUTHEY:—Battle of Blenheim; Inch Cape Rock; Lord William; Bishop Bruno; Well of St. Keyne.

SCOTT:—Lady of the Lake; Wild Huntsman; Fire King.

BYRON:—A Distant View of Harrow on the Hill; Childish Recollections; Manfred; Childe Harold, Canto I; Cain.

KEATS:—Hyperion; Ode to a Grecian Urn; Chapman's Homer (Lines, etc.).

SHELLEY:—Ode to the West Wind; The Cloud; The Skylark; Alastor; Ozymandias; Adonais; Hellas Choruses.

TENNYSON:—The Poet; The Princess; In Memoriam.

BROWNING:—Christmas Eve and Easter Day; Saul; Johannes Agricola; Pictor Ignotus; Fra Lippo Lippi; Andrea del Sarto; The Bishop orders his Tomb at Saint Praxed's Church; Bishop Blougram's Apology.

Honours. Third Year. (New Curriculum).

The Honour subjects fall into two groups, under the heads of Language and Literature, respectively. The group preferred by the student will be regarded as his chief group; the other as his subsidiary group, in which he will take the subjects marked by an asterisk. An honour student must take the ordinary course in English, and his standing in it will be reckoned in the awarding of Honours.

A. **Language**—ANGLO-SAXON. SWEET, *Anglo-Saxon Reader (the whole); BEOWULF. The text of *Beowulf* will be read in class and illustrated by notes on origins, phiology and verbal emendations. *Text-Book*: Harrison and Sharp (Ginn).

MŒSO-GOTHIC. The course on Moeso-Gothic is intended to open the way to the comparative study of allied Teutonic languages. Particular attention will be given to the phonological relations of Moeso-Gothic and Anglo-Saxon. *Text-Book:* ULFILAS (Heyne).

EARLY ENGLISH. The course is intended to give a knowledge of dialectal English and to illustrate the changes the language has undergone. *Text-Book:* MORRIS, Specimens of Early English, Part I, 1150-1300. (Clarendon Press.)

Lectures on Language (Ordinary and Honour), seven hours a week.

B. **Literature**.—CHAUCER, *House of Fame (Skeat, Minor Poems of Chaucer, Clarendon Press); ENGLISH MIRACLE PLAYS, (Pollard, Clarendon Press); SIDNEY, An Apologie for Poetry (Cook); EARLE, Microcosmographic (Arber); MILTON, *Shorter English Poems, Paradise Lost, Books I and II, (Browne, Clarendon Press); *Areopagitica (Hales); DRYDEN, Annus Mirabilis, Absdom and Achitophel, Part I, Preface to the "Fables" (Globe Edition or for Absolom and Achitophel, Dryden's Satires (Collins, Macmilan); *Essay of Dramatic Poesie (Arnold, Clarendon Press); ADDISON, Essays on Paradise Lost (Cook, Ginn), and on the Imagination (*Spectator*, Morley, Routledge); Cato (Bohn, Vol. I); OTWAY, Selections (Mermaid Series); CAMPBELL, Pleasures of Hope; WORDSWORTH, *Prelude; *ENGLISH ESSAYS (Lobban, Warwick Library) MATTHEW ARNOLD, Essays, Second Series (Macmillan).

Lectures on Literature, six hours a week.

Honours Fourth Year. (Old Curriculum.)

MŒSO-GOTHIC.—The course on Mœso-Gothic is intended to open the way to the comparative study of allied Teutonic languages. Particular attention will be given to the phonological relations of Mœso-Gothic and Anglo-Saxon. *Text-Book:* The Gospel of St. Mark (Skeat, Clarendon Press). One hour a week.

ANGLO-SAXON, BEOWULF.—The text will be read in class and illustrated by notes on origins, philology, and verbal emendations, *Text-Book:* Harrison and Sharp (Ginn). One hour a week.

EARLY ENGLISH.—*Text-Book:* MORRIS and SKEAT'S Specimens, Part II, Extt. X-XX. One hour a week.

SHAKSPERE.—The social and literary conditions of Elizabethan England will be noticed, and the characteristics of the pre-Shaksperian drama specially illustrated. The following plays have been selected for special criticism and private study: Love's Labour's Lost

(Rolfe); A Midsummer Night's Dream (Deighton, Macmillan); Hamlet (Deighton, Macmillan); and the Tempest (Deighton, Macmillan). One hour a week.

LATER STUART PERIOD.—An introductory sketch of the critical and philosophical essayists in verse, leading up to a more minute examination of the following works of POPE, which have been selected for private study; Essay on Criticism (Churton Collins, Macmillan); Essay on Man (Morris, Macmillan). One hour a week.

MODERN POETS.—An interpretation in detail of TENNYSON's In Memoriam and a comparative criticism of other famous English poems of the same class. An outline of the growth of the Arthur Saga and a special examination of TENNYSON's Idylls of the King. BROWNING, Christmas Eve and Easter Day.

In addition to the peoms just mentioned, MILTON's Lycidas, SHELLEY's Adonais, and MATTHEW ARNOLD's Thyrsis have been selected for private study. One hour a week.

Honour students of the Fourth Year will, privately study the following works: MORE, Utopia; MATTHEW ARNOLD, Essays in Criticism (the Second Series).

Readings from authors who do not find a place in the above courses will be given by Prof. Moyse on Saturday's at noon. The selections will be taken for the most part from writers of the present century. Attendance is voluntary.

Department of Modern Languages.

Lecturers:—Leigh R. Gregor, B.A., Ph.D.
E. T. Lambert, B.A.

A.—French.

Lecturer:—M. Ingres, B-ès-Lettres.
Sessional Lecturer:—J. L. Morin, M.A.

The position which this University occupies in the midst of a very large French-speaking population entails especial obligations on a Department of Modern Languages, at the same time that it provides it with valuable opportunities. On the one hand, a permanent demand is made for courses of a practical, conversational character; on the other, the Department is aided in its work by the co-operation

of French church services, French family life, French newspapers, French literary clubs, public lecture courses in the French language.

The following dual courses (extending through the first two years) are the outcome of a gradual process of adaptation of the work of the Department to its circumstances. In drawing them up, the Department has endeavoured to meet the needs of the professional men of the Province of Quebec (every student being given the opportunity to learn to speak French fluently), and also to provide for the rigorous maintainence of scientific methods. In Course 1 the study of Grammar and Literature is carried on in accordance with the usual academic traditions. In Course 2, the same subjects are taught by the Natural method.

In the Third and Fourth Years all lectures are given and all studies carried on in the French language. The French course, as a whole, aims to give students a general knowledge of French culture and literature, as well as a reading, writing and speaking acquaintance with the French language.

Ordinary First Year.

1. BERTENSHAW and JANAU'S Manual of French Composition (Longmans), including the prose passages for translation into French appended thereto. The following texts will be read and studied: MOLIERE, L'Avare (Macmillan); LA FONTAINE, Fables, Livre premier; SANDEAU, Mademoiselle de la Seiglière (Heath & Co.); AUGIER ET SANDEAU, Le Gendre de Monsieur Poirier (Heath & Co.); DAUDET, Trois Contes Choisis (Heath & Co.).

There will be regular written exercises—dictation, translation and composition.

2. The following outline will indicate the character of this Section, in which the Natural Method and the French language are exclusively used. (*a*). The oral reproduction of stories by French writers of the present century, so selected as to bring out the national aspects of French life. In connection with this part of the work, words will be referred to groups and their formation noticed. (*b*) Biographical sketches of the leading writers of the present century, illustrated by typical selections from their works, which will be read by the class, and committed to memory. Points of grammar will be treated incidentally, and the elements of French prosody taught. A general outline of French literature from its origin to the present day will be given. (*c*) Private Reading, the character of which will be determined by the requirements of the individual student. The following works may be taken as specimens of the literature chosen for the class: Pages Choisies d'ALEXANDRE DUMAS (H. Parigot), ed. Colin; A. DE VIGNY, Servitude et Grandeur militaires; FLAUBERT

Trois Contes. (*d*) Students will be guided in a general study of French History. L'Histoire de France, by AUGE ET PETIT (ed. Larousse) is recommended for private reading.

Students are recommended to use Le Dictionnaire LAROUSSE.

The examination for the students of affiliated colleges will include the whole of Course 1, and in ddition the whole of Pages Choisies d'ALEXANDRE DUMAS, and FLAUBERT, Trois Contes.

Four hours weekly, two for each Course.

Second Year.

3. BERTENSHAW and JANAU'S Manual of French Composition, including the prose passages for translation into French appended thereto. The following texts will be read and studied: LOTI, Pêcheurs d'Islande (Rivington, Percival & Co.); RACINE, Athalie (Pitt Press); VICTOR HUGO, Ruy Blas (Heath & Co.); DUMAS, La Question d'Argent.

There will be regular written exercises in composition and translation.

4. The method used in this Course is the same as in 2 of the First Year, but the more advanced points of grammar will be treated, and in literature particular attention will be directed to characteristics of style. The history of French Literature in one period will be treated more fully. Students are recommended to use Le Dictionaire LAROUSSE.

The following works may be taken as specimens of the reading chosen for the class: Pages Choisies de LESAGE (P. Morillot), ed. Colin; Pages Choisies de TH. GAUTHIER (P. Sirven), ed Colin; MICHELET, La Bible de l'Humanité; G. SAND, Le Marquis de Villemer. Students will be guided in a general study of French History. The first volume of VICTOR DURUY'S Histoire de France is recommended for private reading.

The examination for the students of affiliated colleges will include the whole of Course 3, togethr with the whole of Pages Choisies de TH. GAUTHIER in Course 4.

Four hours weekly, two in each Section.

Third Year.

5. In order to be admitted to this Class a student must understand French well enough to take lectures delivered in that language. The course will include a rapid survey of old French and Provençal Epic and Lyric poetry, a brief sketch of the Mediaeval Drama, and a more detailed analysis of French literature in the sixteenth and seventeenth centuries. The influence of the French classic spirit on European literature and its survival in French-Canadian literature will be briefly treated. Students will be called upon to read typical selections from the works of great writers of the periods referred to above, and will

also read the whole of the followning texts:—CORNEILLE, Le Cid; RACINE, Esther; MOLIERE, Le Misanthrope, Le Bourgeois Gentilhomme; BOILEAU, L'Art Poétique; BOSSUET, Oraison Funèbre sur le Prince de Condé; LA FONTAINE, Fables Choisies (Henry Holt & Co.).

The historical development of the French language will be referred to only when it suggests itself spontaneously in connection with archaic or unusual forms of words.

There will be regular oral and written French compositions on literary subjects.

Four hours weekly.

6. For the transition term of 1900-1901 this Course will consist of the Lectures on Literature, part of the Composition work and half of the Authors prescribed in theThird Year. **Fourth Year.**

Two hours weekly.

Honours. Third and Fourth Years.

The work of the Honour Classes in French is divided into three sections. The First includes the Historical Study of the French Language, the Second the History of French Literature, the Third French Composition and the Reading and Study of French Texts. The First and Second sections are taken up in alternate years, the Third annually. The Honours Course is regarded as a whole, students of the Third and Fourth Years taking lectures together. The course of a Third Year student will include Course 7 or Course 8, together with Composition and as many of the texts prescribed in Course 9 as it may appear advisable to assign to that year. The course of a Fourth Year student will consist of the remainder of the prescribed studies. The French language alone will be used in class instruction.

7. This course will deal with the historical development of the French language from its origin to the present day. A brief account will be given of the Low Latin as found in *graffiti*, correspondence, grammarians' glossaries, etc., and as ascertained by tracing back old French words to their origin in accordance with known laws. The Old French Period will be treated with much more detail, and in this connection the oldest texts, Serments de Strasbourg, Cantilène de Sainte Eulalie, short portions of the Passio Christi, Vie de Saint Léger, Vie de St Alexis, (KOSCHWITZ, Les plus anciens monuments de la langue française and GASTON PARIS, Vie de Saint Alexis), and longer extracts from the Chanson de Roland (GASTON PARIS), will be read and interpreted. Students will receive assistance in acquiring a fair reading knowledge of Old French subsequent to the Chanson. Provençal grammar will necessarily be referred to, and it may be possible to overtake the reading of Provençal texts (BARTSCH, Chrestomathie). The Grammar of the Modern French **Philology 1901-1902.**

Period will be included as well, and will be shown to be the regular outcome of this long process of development. Peculiarities of the Canadian speech will also be noticed. Students will make constant use of SCHWAN'S Altfranzösische Grammatik (revised by Behrens); DARMESTETER'S Cours de Grammaire Historique and HORNING'S Grammar prefixed to BARTSCH'S Chrestomathie. A large and carefully chosen Romance library will be placed at their disposal.

Four hours weekly.

History of Literature 1900-1901

8. A general and comprehensive survey of French Literature from its origin to the present day. Students will use LINTILHAC'S and LANSON'S Histories of French Literature as text-books in order to prepare for lectures. They will furthermore be required to make constant reference to the numerous Monographs and Special Histories to be found in the Library, and to write *resumes* in the French language of (*e. g.*) chapters of the Histoire de la Littérature Française edited by PETIT DE JULEVILLE.. During the Session 1900-1901 a detailed course will also be given on the History of French Dramatic Literature, with special reference to the influences which moulded it at its origin.

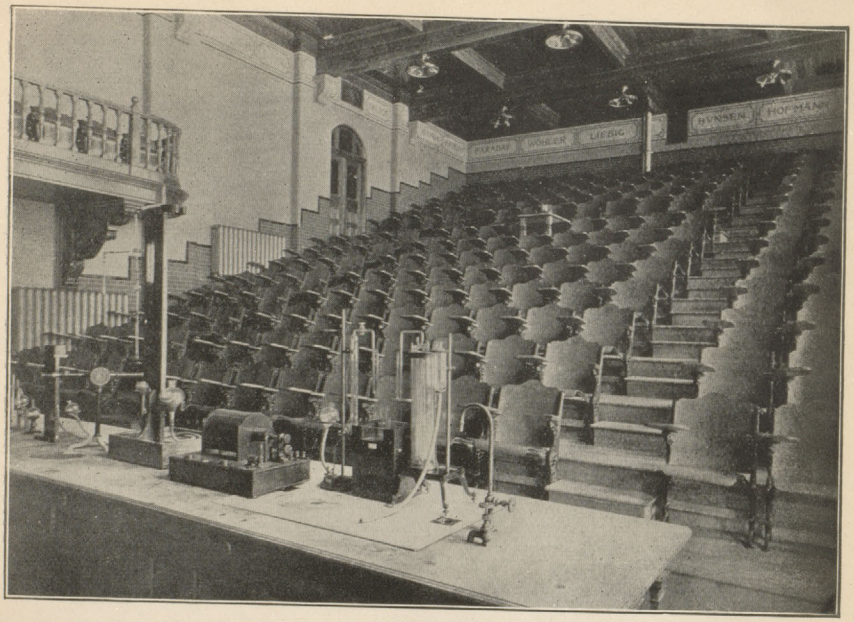
Four hours weekly.

Texts and Composition.

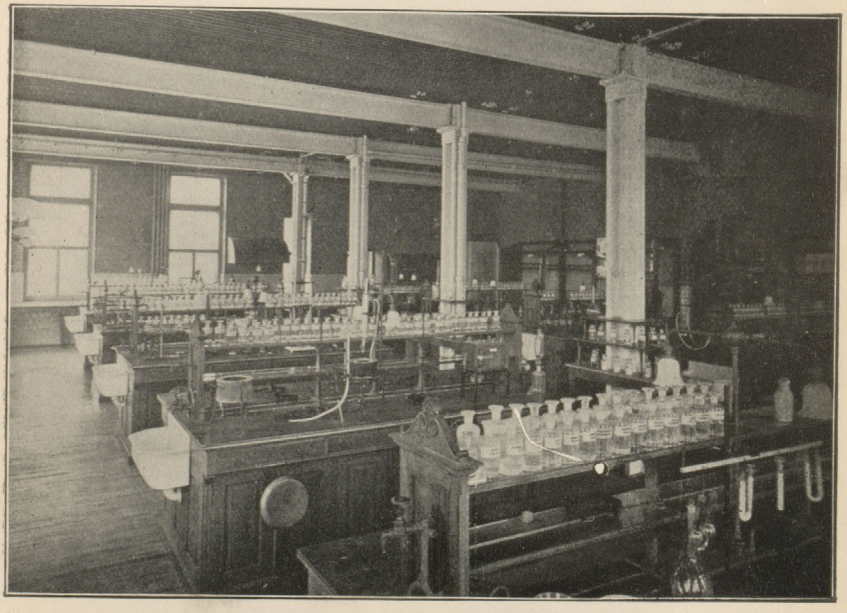
9. Students will receive special instruction in the Art of Composition. They will be expected to write a number of French papers on literary and other subjects.

Students will find it necessary to read a considerable number of the following texts during their summer holidays, and are strongly recommended to make a beginning in the summer which precedes their Third Year Course. A critical knowledge of the contents is required.

BOILEAU, Le Lutrin; LA FONTAINE, Fables (Books II and V); PASCAL, Lettres Provinciales (Lettre XIV); LA BRUYERE, Caractères (Chapters I, II, V, VIII) (éd. Hachette); BOSSUET, Oraison Funèbre sur Henriette-Marie de France; DE RETZ, Mémoires (Selections); MADAME DE SEVIGNE, Lettres (Selections); FENELON, Lettre à l'Académie Française; VOLTAIRE, Prose (Heath & Co.); FLORIAN, Estelle et Némorin; MARIVAUX, Jeu de l'amour et du hasard (Bibliothèque Nationale); LESAGE, Gil Blas (Selections); BEAUMARCHAIS, Le Mariage de Figaro (Delarue); BERNARDIN DE SAINT-PIERRE, Paul et Virginie; CHATEAUBRIAND, Atala, René; MADAME DE STAEL, de l'Allemagne, Lectures Choisies (Pellissier); VICTOR HUGO, Cromwell (including the Preface), Hernani, Les Orientales (Selections), Les Contemplations (Selections); LAMARTINE, Méditations (Selections), Harmonies poétiques et religieuses (Selections); ALFRED DE VIGNY, Poèmes antiques et barbares (Selections), Chatterton; BALZAC, Eugénie Grandet; DUMAS FILS, La Question d'Argent; DELAVIGNE, Les



Macdonald Chemistry Building.—A Lecture Theatre.



Macdonald Chemistry Building.—A Laboratory.

Enfants D'Edouard; DE MUSSET, Poésies et Comédies (Ginn & Co.); FLAUBERT, Trois Contes (Charpentier); RENAN, Pages Choisies (Calmann Lévy); LECONTE DE LISLE (Selections); SULLY PRUDHOMME (Selections); MAUPASSANT, Contes Choisis (Jenkins); ROSTAND, Cyrano de Bergerac; ZOLA, La Débâcle (Heath & Co.).

One hour weekly.

N.B.—Students will take as part of their Honour Course in Modern Languages, the Third and Fourth Year Ordinary Course in History and that section of the Ordinary Course on Comparative Philology which deals with phonetics and the general principles of linguistic development.

B—German.

Lecturers:—L. R. Gregor, Ph.D.
E. T. Lambert, B.A.

Ordinary

The ordinary Courses mainly keep practical ends in view. As far as possible they place the student in the position of one who studies the language from within. In the first two years special attention is given to Grammar, in the Third and Fourth to Literature. Classic texts are carefully studied, from the aesthetic and critical as well as from the historical and linguistic points of view. A considerable amount of translation is done in class, and English-German exercises are supplemented by the translation of easy prose passages and the "re-translation" of texts. Importance is attached to correct and expressive reading aloud.

First Year.

1. THE JOYNES-MEISSNER German Grammar, including all English-German exercises in translation (Heath & Co.); SCHILLER, Maria Stuart (Heath & Co.); UHLAND, Ballads and Romances (Macmillan & Co.); FREYTAG, Die Journalisten (Holt & Co.); WILDENBRUCH, Der Letzte (Heath & Co.); WACHENHUSEN, Vom ersten bis zum letzten Schusz (Macmillan & Co.); a few well-known German poems will be committed to memory; dictation; colloquial exercises; prominence is given to written work.

Four hours weekly.

Second Year.

2. THE JOYNES-MEISSNER German Grammar; SCHILLER, Die Jungfrau von Orleans (Heath & Co.), Das Lied von der Glocke (Holt & Co.); GOETHE, Hermann und Dorothea (Heath & Co.); LESSING, Minna von Barnhelm (Clarendon Press); HAUFF, Die Karavane; notes on a few of the great names of German Literature, such as Otfried von Weissenburg, Das Nibelungenlied, Wolfram von Eschen-

bach, Martin Luther, Martin Opitz, Klopstock, Lessing, Herder, Goethe, Schiller, Heine. Prominence is given to written exercises, which include prose passages for translation into German from HORNING'S German Composition.

Four hours weekly.

Third Year.

3. GOETHE, Egmont (Ginn & Co.); SCHILLER, Wallenstein's Lager and Wallenstein's Tod; Book of German Dactylic Poetry (Pitt Press); HEINE, White's selections from his poems (Heath & Co.); SCHEFFEL, Trompeter von Säkkingen (Heath & Co.); Translation of prose passages from English into German; History of German Literature up to the middle of the 18th Century.

Four hours weekly.

Fourth Year.

4. For the transition term of 1900-1901, this Course will consist of the following portions of the Third Year Course. GOETHE, Egmont (Ginn & Co.); SCHILLER, Wallenstein's Lager and Wallenstein's Tod; Translation of prose passages from English into German; History of German Literature up to the middle of the 18th Century.

Two hours weekly.

Honours

5. The work of the Honours Classes in German is divided into three Sections. The First includes, broadly speaking, the Historical study of the German Language; the Second, the History of German Literature; the Third, German Composition and the Reading and Critical study of German Texts. The First and Second sections are taken up in alternate years; the Third annually. The Honours Course is regarded as a whole, students of the Third and Fourth years taking lectures together. The course of a Third Year student will consist of Course 5 or Course 6 (Course 6 in German being taken up in the same year as Course 7 in French, and *vice versa*), together with the Composition in Course 7, and as many of the texts as it may appear advisable to assign to that year. The course of a Fourth Year student will consist of the remainder of the prescribed studies. The German language alone will be used in class instruction.

In order to obtain Honours, candidates must be capable of speaking German fluently.

Germanic Philology

6. This course is intended to include (*a*) a general outline of the development of the German language from its origin to the present day. in the course of which the operation of the principal laws exemplified in the growth of the language will be traced.

(*b*) A special study of the Middle High German period; its language and literature, with selected texts. The philological relations

between the Middle High German and the modern idiom will be pointed out.

(*c*) An introductory course in Old High German, regarded chiefly in its relation to the evolution of the German language.

The following books will be used:—BACHMANN, Mittelhochdeutsches Lesebuch (Fasi & Beer, Zurich); BEHAGHEL, Deutsche Sprache; WRIGHT, Middle High German Primer (Clarendon Press); WRIGHT, Old High German Primer (Clarendon Press).

Three hours weekly.

History of Literature 1901-1902.

6. A comprehensive course of lectures on the History and Development of German Literature from its origin to the present day. In order to be able to follow the course intelligently, students must previously master KLUGE'S Geschichte der Deutschen Litteratur. Students will be required to make frequent reference to the larger Biographies and Histories to be found in the University Library, and to prepare digests in the German language of numerous chapters in the same. During the session 1901-1902 Goethe's Faust (more especially the First Part) will be interpreted, and a number of lectures given on its origin and composition, as well as on the Faust literature, and the history of the Faust legend.

Three hours weekly.

Texts and Composition.

7. Students are required to familiarize themselves with the following texts, and to make a critical study of the style and contents of those which possess enduring literary value. It will be found necessary to begin the reading of these texts in the summer holidays which precede the Third Year's course.

Students will be required to write German essays on literary and other subjects.

KLOPSTOCK, Messias, Cantos I, II and III, Odes (Selections); LESSING, Emilia Galotti, Nathan der Weise, Litteraturbriefe (Selections), Laokoon (Selections); SCHILLER, Kabale und Liebe, Don Carlos, Die Braut von Messina; GOETHE, Leiden des Jungen Werther, Dichtung und Wahrheit (Holt & Co.), Torquato Tasso, Iphigenie; WIELAND, Oberon (Selections); HERDER, Volkslieder (Selections); KLEIST, Kätchen von Heilbronn; HEINE, Prose (Clarendon Press); GRILLPARZER, Sappho; FREYTAG, Bilder aus der deutschen Vergangenheit (Selections); HEYSE, L'Arrabbiata; SEIDEL, Leberecht Hühnchen; SUDERMANN, Johannes, Die drei Reiherfedern; HAUPTMANN, Die Versunkene Glocke; MARIA VON EBNER—ESCHENBACH, Das Gemeindekind; BERTHA VON SUTTNER, Die Waffen nieder; WILDENBRUCH, Der Katzensteg.

One hour weekly.

Semitic Languages.

Professor:—D. Coussirat, B.A., B.D., D.D., Officier de l'Instruction Publique.

The course comprises lectures on the above languages and their literature, their genius and peculiarities. Comparative philology, affinity of roots, etc., also receive due attention, while the portions selected for translation will be illustrated and explained by reference to Oriental manners, customs, history, etc.

Ordinary

Second Year.

1. Hebrew grammar and translation. English rendered into Hebrew. Masoretic notes explained. The Hebrew text compared with the Septuagint and Vulgate Versions.
Four hours a week.

Third Year.

2. Hebrew Syntax. Translation of difficult passages of the Old Testament. Notes on the MASSORA and the TALMUD (Mishna and Gemara).
Two hours a week.

Fourth Year.

3. Translation continued. Characteristics of the Semitic Languages, particularly of ARAMAIC, SYRIAC, SAMARITAN, RABBINIC, ARABIC, ASSYRIAN, SEMITIC INSCRIPTIONS.
Two hours a week.

Honours.

Third Year.

4*a*. HEBREW. Genesis. Isaiah, 40-66. Ecclesiastes. *Literature.*—F. LENORMANT, The Beginnings of History.

Hebrew —The course for the Second Year.

Hebrew. —The course for the Fourth Year.

4*b*. ARAMAIC.—Daniel. Ezra. Selections from the Targums. *Literature.*—SAYCE, Lectures on the Origin and Growth of Religion.
Two hours a week.

Fourth Year.

5*a*. HEBREW.—Malachi, Psalms, 1-72 ; Job, 26-42. *Literature.*—RENAN. A general History of the Semitic Languages.

5*b*. SYRIAC.—Selections from the Peshito, and from the CHRONICLES OF BAR HEBRÆUS. *Literature.*—W. WRIGHT, Comparative Grammar of the Semitic Languages.
Two hours a week.

4*b* and 5*b* (*Literature excepted*) are the Additional Courses.

History.

Professor:—Charles W. Colby, M.A., Ph.D.

1. The German Inroads and the Early Middle Ages.

Ordinary First Year

Twenty-five lectures will be given on the following, and other kindred, topics; the later Roman Empire, the German invasions, the rise of Mohammedanism, Charlemagne, the origin of Feudalism, the formation of modern states, the Holy Roman Empire, Monasticism, the spread of Christianity beyond the Rhine, the Northmen. The design of the course is to explain the transition from classical to mediaeval civilization. The Sessional Examination will be based on the lectures and on the following text-book :—

"European History," by Prof. G. B. Adams (Macmillan).

At the Sessional Examinations the results will be counted under the head of English. Members of the class will be required to present short essays on historical subjects at regular intervals.

One hour a week.

2. Epochs of European History, 1032-1848.

Third or Fourth Year.

This is a general course dealing with the historical development of European nations from the revival of society in the 11th century to the overthrow of the July Monarchy. Special attention will be devoted to institutions and movements. Topics for investigation will be assigned at each lecture, and students will write two theses in the course of the year. Apart from topical readings, the following books are prescribed:—

Bryce, The Holy Roman Empire (Macmillan).

Symonds, The Renaissance in Italy, abridged by Pearson (Smith & Elder).

Seebohm, The Era of the Protestant Revolution (Longmans).

Gardiner, The Thirty Years' War (Longmans).

Hassall, The Balance of Power (Macmillan.)

Fyffe, Modern Europe, one volume edition (Holt).

Four hours a week.

Honours. Third Year.

3. Sources of Mediaeval History.

A course for Honour students which may be regarded as a supplement to History. 2. The leading mediaeval authorities will be classified and described. Illustrative texts will also be read, *e. g.*, for 1900--1901, Einhard, Vita et Gesta Caroli; the anonymous Vita Henrici IV, and Otto of Freising's Gesta Frederici Imperatoris.

One hour a week.

4. The Reformation, 1521-1648.

These lectures will examine the progress of the Protestant Revolution in the principal states of Europe from the Diet of Worms to the Peace of Westphalia. Typical dogmatic systems will be described and the connection of sectarian movements with national statecraft and politics will be indicated. A considerable amount of reading, and at least one thesis, will be required.

Three hours a week.

5. The French Revolution, 1789-1795.

Three hours a week.

(Omitted in 1900 and 1901.)

Texts.

Honour students in History will be examined at the end of the Third Year on the following texts:—

Herodotus, VI-VIII, Macaulay's trans.; Thucydides, I, II, 1-65, VI, VII, Jowett's trans.; Plato, The Republic, Jowett's trans.; Plutarch, The Lives of Aristides, Themistocles, Pericles and Timoleon, Clough's trans.; Polybius, I, II, V, Shuckburgh's trans.; Livy, XXI-XXII, Church and Brodribb's trans.; Tacitus, Annals II, Germania, Vita Agricolae, Church and Brodribb's trans.

Honour students in History will be examined at the end of the Fourth Year on the following texts:—

Clarendon, History of the Rebellion, Book XI.; Gibbon, Decline and Fall, chaps. XLIV, L. LI, LXVI; Burke, Reflections on the French Revolution; Macaulay, History of England, chap. III.; Bagehot, The English Constitution; Stubbs, Select Charters, Introduction; Lord Acton, German Schools of History, English Historical Review, Vol. I; Matthew Arnold, Pagan and Mediaeval Religious Sentiment, in Essays in Criticism (First Series); Captain Mahan, The Influence of Sea Power on History; Langlois et Seignobos, Méthode à Etudier l'Histoire.

Summer Readings.

Students who intend to take History 2 are advised to read the books prescribed under that course, during the summer vacation.

In connection with History 4, Honour students of the Third and Fourth Years are advised to read the following books during the summer vacation:—

Kœstlin, Life of Luther (Cassell).

Emerton, Erasmus (Putnam).

Gindely, The Thirty Years' War (Bentley).

JOHNSON, European History, 1494-1598 (Macmillan).
FLETCHER, Gustavus Adolphus (Unwin).
LODGE, Richelieu (Macmillan).

HONOUR COURSE IN HISTORY.

Students of the Third Year who are candidates for Honours in History will take the following courses: History 2, 3, 4; Political Science and Economics; and an additional course, or a half-course in either (*a*) Constitutional Law and History; (*b*) Ancient History; or, (*c*) Art and Archaeology.

Students of the Fourth Year who are candidates for Honours in English Language and Literature, *or* in Modern Languages, will take History 4.

Constitutional Law and History.

This course, which covers the entire session, will be given by Dean Walton and Dr. Colby. The lectures may be divided, according to subject, into separate parts:

1. The Constitutional History of England up to the time of Edward I (with a brief review of the most important developments which have taken place since that period). While legislative, executive and judicial functions will be examined in fullest detail, questions relating to land tenure, the church and the towns will also be considered.

2. The Constitutional Law of Canada—The Subject will be treated in the following order:—1. Canadian Constitutional History prior to Confederation. 2. The British North America Act, and the leading cases under it which illustrate the respective powers of the Dominion and the Provinces. 3. The fundamentals of English Constitutional Government which form the basis of the Canadian Constitution. 4. The Cabinet System. 5. The difference between English and French practice as to responsibility of officials.

Four hours a week.

Mental and Moral Philosophy.

Professor:—J. Clark Murray, LL.D.
Lecturers:—P. T. Lafleur, M.A.
Hilda D. Oakeley, M. A.

Ordinary Second Year.

1. This course takes up in the first term the elements of **Psychology**; in the second the elements of **Logic.** Students are referred, among other works, to MURRAY, Handbook of Psychology, Book I., and to JEVONS, Elementary Lessons on Logic.

Three hours a week.

Third Year.

2. In the first term a course on **Moral Philosophy** discussing the problems of Ethical Theory on the lines indicated in Murray's Introduction to Ethics, pp. 1-234.

3. In the second term an advanced course on **Logic and Psychology.** The first part takes up the Logic of Induction, for which students are referred specially to Mill's System of Logic, Book III. The second part takes up the most interesting problems in the Psychology of Cognition, tracing, as far as possible, the principal stages of the evolution of intelligence. The general problem, also, of the nature of knowledge is discussed, in view of the light which it throws on the ultimate nature of reality. Students are referred, among other works, to MURRAY, Handbook of Psychology, Book II, Part 1.

4. In the second term there is also a course on the **History of Philosophy.**

Fourth Year.

5. In the first term a course on Moral Philosophy, identical with 2.

6. In the second term the problems of Applied Ethics are discussed on the lines indicated in Murray's Introduction to Ethics, pp. 235-404.

7. In the second term there is also course on the History of Philosophy, identical with 4.

N.B.—In all the classes of Mental and Moral Philosophy students are required to write essays on Philosophical subjects, or to perform exercises in Logic.

All these classes in the Third and Fourth Years meet four hours a week.

Honours.

Candidates for Honours in Philosophy are in general required to take all the Ordinary Courses in Logic and Metaphysics, in Moral Philosophy, in Political Science and Economics, as well as the following Honour Courses:—

Third Year.

8. This course is devoted mainly to the history of Greek Philosophy. It begins with the colonial period, during which philosophical activity was most energetic among the colonies of the Greeks in Asia Minor and Italy. It then passes on to the Athenian period, beginning about the middle of the fifth century, B. C., when Philosophy found a home in the greatest centre of intellectual life in the anciend world. A third period is then described, during which Philosophy extends its culture over ancient life by the spread of the great schools, especially the Stoical and the Epicurean, which arose towards the end of the fourth century, B. C. Finally, some account is given of the movement, of which Alexandria was the centre, and by which

Greek Philosophy was brought into contact with Oriental thought. The history is carried down to the closing of the Pagan Schools in Athens by the Emperor Justinian. Occasional lectures are also given on the other special studies of the Third Year Honour Course. Students are expected to make an independent study of the fragments of one of the early philosophers, and to write an essay embodying the results of their study.

The subjects of examination will be, in addition to the lectures, the following:—

Schwegler's History of Philosophy, Chapters 1-21 inclusive; Mill's System of Logic, Books IV. and V.; James' Principles of Psychology, Chapters 10, 16 inclusive; selected portions from Bosanquet's Logic, Lotze's Logic, and Hobhouse's Theory of Knowledge; Plato's Theatetetus (by S. W. Dyde); Fraser's Selections from Berkeley.

Fourth Year.

9. The lectures of this Year form two courses. One is devoted to the earlier period of Modern Philosophy. After sketching the transition from Mediaeval to Modern thought, the course gives some account of the Empirical movement started in England by Bacon and Hobbes, and developed by Locke and his school. The Idealistic tendency of speculation during this period is sketched mainly in three movements:—that which began in England with the Cambridge Platonists, and culminated in Berkeley; the German movement originated by Leibnitz, and formulated by Wolf; the Cartesian movement, which culminated in Spinoza. The course closes with a lengthy exposition of KANT's three Critiques.

10. The other course is on the History of English Philosophy from Hartley to Herbert Spencer. The lectures discuss the chief characteristics of English thought during the last one hundred and fifty years, more particularly as shewn in the works of English psychologists and political writers during that time. The writers to whom special attention is given are: in Psychology—PRIESTLEY, HARTLEY, ERASMUS DARWIN, the two MILLS, BAIN, and HERBERT SPENCER; in Political and Social Science—BURKE, PAINE, GODWIN, PALEY, BENTHAM, MALTHUS. References are also made to minor writers, whose work may be deemed to be of sufficient importance in the general movement and development of philosophy. No text-book is specially recommended; but the student is expected to read appointed selections from the writers under discussion, as well as to consult LESLIE STEPHEN's History of English Thought in the Eighteenth Century, and a few chapters in LEWES' History of Philosophy.

The principal points emphasized in the lectures are the empirical character of the English school in psychology and metaphysics, and the practical, utilitarian view of English political writers.

Students are expected to write an essay exhibiting an independent study of one of the modern philosophers.

The subjects of examination, in addition to the lectures, will be Erdmann's History of Philosophy, Vol. II. (Engl. Transl.); James' Principles of Psychology, Vol. II.; Spencer's First Principles; Watson's Outline of Philosophy; Mill's System of Logic, Book VI; Aristotle's Nicomachean Ethics; Zeller's Stoics, Epicureans and Sceptics; Spinoza's Ethics; Watson's Selections from Kant; Maine's Ancient Law.

The Honour lectures are in general four a week in each year.

Mathematical and Physical Sciences.

(Ordinary Courses.)

Professors:—A. Johnson, M.A., LL.D. (Mathematics and Astronomy).
" John Cox, M.A. (Physics).
" E. Rutherford, M.A. (Physics).
Lecturer:—Rev. H. M. Tory, M.A. (Mathematics).
Demonstrators in Physics:—R. O. King, B.A.Sc.; R. K. McClung, B.A.; J. W. Fraser, B.Sc.

Ordinary First Year. 1. MATHEMATICS—Arithmetic.—Euclid, Books 1, 2, 3, 4, 6 (omitting propositions 27, 28, 29), with definitions of Book 5, TODHUNTER'S edition, or HALL and STEVENS, the latter is recommended to students in advanced sections especially.—COLENSO'S Algebra (Part I) to end of Quadratic Equations, or HALL AND KNIGHT'S Elementary Algebra.—HALL AND KNIGHT'S or LOCK'S Elementary Trigonometry. Nature and use of Logarithms.
Four hours a week.

Ordinary First Year. 2. PHYSICS.—This course has two objects:—(1) to give the minimum acquaintance with Physical Science requisite for a liberal education to those whose studies will be mainly literary; (2) to be introductory to the courses in Chemistry and other branches of Natural Science, and to the more detailed courses in Physics in the Third and Fourth Years. Only the most important principles in each branch of the subject will be treated, as far as possible with reference to their historical development and mutual relations; and they will receive concrete illustration in the study of the principal instruments in daily use in the laboratory. Two illustrated lectures will be given per week. During the session each student will be required to at-

tend in the laboratory eight times, and make measurements involving the use of the following instruments:—*Balance, Pendulum, Barometer, Thermometer, Sonometer, Telescope or Microscope, Tangent Galvanometer, Wheatstone's Bridge.*

Outline of Syllabus. The scope and method of Science. Primary Phenomena ("States and Properties of Matter"), Motion, Velocity, Acceleration, Laws of Motion, Momentum, Energy, Work. The Parallelogram Law for Velocities and Forces, Equilibrium and the Simple Machines. Uniform circular motion, Vibration, the Pendulum, Fluid Pressure, the Barometer, Specific Gravity. Summary of *Mechanics*, indicating the principle of the Conservation of Energy.

The missing Energy traced in (1) *Sound.* Nature of wave Motion. Intensity, Pitch and Quality of Musical Notes. The stretched String and Organ Pipe. Resonance.

(2) *Heat.* Temperature and the Thermometer. The Calorimeter, Fusion and Vaporisation. Laws of Boyle and Gay-Lussac. The Mechanical Equivalent. Application of Conduction, Convection and Radiation to common problems of Climate, Ventilation, etc.

(3) *Light.* Reflection, Refraction, the Spherical Mirror, Prism, Lens, Microscope, Telescope, Spectroscope, Polariscope. Principle of Interference and sketch of the Undulatory Theory.

(4) *Electricity and Magnetism.* The Electrophorus, the Modern Induction Machine, the Condenser. Coulomb's Law of Force. The idea of Potential. The Quadrant Electrometer. Atmospheric Electricity. Magnetic Pole, Moment, Field and Law of Force. The Compass and Terrestrial Magnetism. Effects of Current. The Voltameter and Storage Cell. The Galvanometer. Heating Effects. Simple Batteries. Ohm's Law. Units and Measurement of Current Resistance, Electromotive Force. Mutual Mechanical Effects of Conductors and Magnetic Fields. Principle of the Electric Motor. The Electro-magnet. Induction of Currents, and Principle of the Dynamo. Applications to Telegraph, Telephone, Lighting, and supply of Power.

Conclusion.—Restatement of Principle of Conservation of Energy in complete form. Dissipation of Energy.

Two hours a week.

Second Year.

3. A. MATHEMATICS.—Algebro.—The three Progressions; Ratio, Proportion and Variation; Permutation and Combination; Scales of Notation; Logarithms; Interest and Annuities; Elements of Determinants; Geometrical Conic Sections—Solid Geometry (Euclid, Bk. XI and first two props of Bk. XII, or equivalent):—Spherical Trigonometry (Solution of Spherical Triangles with proofs of the necessary preliminary propositions and formulae).

Text-Books:—HALL AND KNIGHT'S Higher Algebra; WILSON'S Solid Geometry and Conic Sections.

3. B. DYNAMICS:—This course is chiefly experimental, and deals with:—Range and Time of Flight of Projectiles; Morin's Machine; Laws of direct Impact of Elastic Bodies; Simple Harmonic Motion; Simple and Compound Pendulum; Determination of Gravity; Moments of Inertia, and their Experimental Determination; Moment of Momentum, and Energy of a Rotating Body.

Three hours a week.

Third or Fourth Year.

4. MATHEMATICS.—Elementary parts of the Differential and Integral Calculus; Elementary Analytical Geometry.

Four hours a week.

Third or Fourth Year.

ASTRONOMY AND OPTICS.—Two hours a week. Half course.

5. A. ASTRONOMY.—GALBRAITH and HAUGHTON'S Astronomy or Brinkley by Stubbs and Brunnow. LOCKYER'S Elementary Astronomy (English edition), and GALL'S "Easy Guide to the Constellations" are recommended as introductory.—The subject is taken with Optics as a half course. The lectures will be given before Christmas. First term; two hours a week.

5. B. OPTICS.—Two hours a week, from January to end of Session. *Text-book.*—Galbraith and Haughton.

Third Year.

6. A. MECHANICS AND HYDROSTATICS.—*Text-book,* LONEY, Mechanics Half course.

6. B. OPTICS as above.

EXPERIMENTAL PHYSICS.—(*First Course*).—LAWS OF ENERGY, SOUND, LIGHT AND HEAT. *Text-book,* GANOT or JONES.

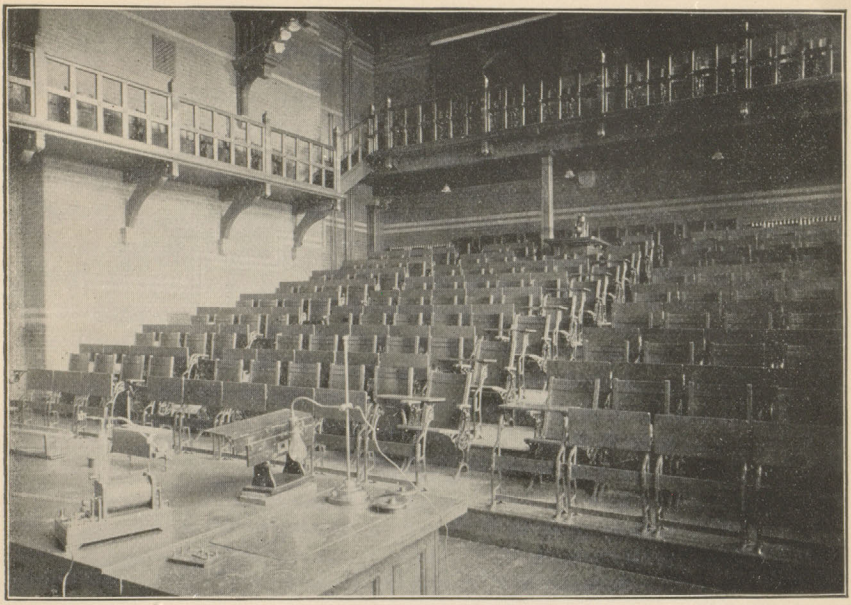
Lectures fully illustrated; two hours a week, with Laboratory Course, three hours a week.

Third Year.

7. A. SOUND.—Velocity of Sound; Determination of Rates of vibration of Tuning Forks; Resonance; Laws of vibration of strings.

7. B. LIGHT.—Photometry; Laws of Reflection and Refraction; Indices of Refraction; Focal Lengths and Magnifying Powers of Mirrors, Lenses, Telescopes and Microscopes; the Sextant, Spectroscope, Spectrometer, Diffraction Gratting, Optical Bench and Polariscopes.

7. C. HEAT.—Construction and Calibration of Thermometers; Melting and Boiling Points; Air Thermometer; Expansion of solids, liquids and gases; Calorimetry; Specific and Latent Heats; Laws of Vapour Pressure; Radiation; the Mechanical Equivalem of Heat.



Macdonald Physics Building.—A Lecture Theatre.

Macdonald Physics Building.—An Elementary Electrical Laboratory.

8. EXPERIMENTAL PHYSICS.—(*Second Course.*)—ELECTRICITY AND MAGNETISM. *Text-book,* GANOT or S. P. THOMPSON. **Fourth Year.**
Lectures fully illustrated; two hours a week, with Laboratory Course, three hours a week.

MAGNETISM.—Measurement of Pole Strength and Moment of a Magnet; the Magnetic Field; Methods of Deflection and Oscillations; Comparison of moments and determination of elements of Earth's magnetism. Frictional Electricity. Current Electricity.—Complete course of measurements of Current Strength, Resistance and Electromotive Force; Calibration of Galvanometers; the Electrometer; Comparison of Condensers; Electromagnetic Induction. **Fourth Year.**

N.B.—For Advanced Courses intended for Electrical Engineering Students and Graduates pursuing the study of Physics, see Calendar, Faculty of Applied Science.

Mathematical and Physical Sciences.

(Advanced Sections and Honour Courses.)

(*a*) MATHEMATICS. **Advanced Sections. First Year.**

9. MATHEMATICS.—HALL and STEVENS, Euclid; CASEY, Sequel to Euclid; HALL and KNIGHT, Advanced Algebra; TODHUNTER or BURNSIDE and PANTON, Theory of Equations (selected course), Two or three hours each week.

10. MATHEMATICS.—LOCK, Higher Trigonometry, with MCCLELLAND and PRESTON, Spherical Trigonometry, Part I; SALMON, Conic Sections, chapters 1, 2, 3, 5, 6, 7, and 10 to 13 inclusive; WILLIAMSON, Differential and Integral Calculus (selected course). **Second Year.**
Three hours a week.

(*b*) MATHEMATICS AND NATURAL PHILOSOPHY. **Honour Courses Third and Fourth Years.**

11. MATHEMATICS.—WILLIAMSON, Differential and Integral Calculus; and BOOLE or FORSYTH, Differential Equations, or SALMON, Geometry of Three Dimensions (alternate years).
ASTRONOMY.—GODFRAY.
Two hours a week.

12. MATHEMATICAL PHYSICS.—MINCHIN, Statics, Vol. I (selected chapters; WILLIAMSON and TARLETON, Dynamics, Chaps. 1 to 8 inclusive; BESANT, Vol. I., Hydro-Mechanics, Part I., chaps. 1, 2, 3, 7; PARKINSON, Optics. **Third Year.**
Two hours a week.
EXPERIMENTAL PHYSICS.—Course 7.

Fourth Year. 13. PHYSICAL ASTRONOMY.—GODFRAY, Lunar Theory; or CHEYNE, Planetary Theory; NEWTON, Principia, Lib. I, secs. 9 and 11, with the necessary preliminary propositions.

Fourth Year. 14. MATHEMATICAL PHYSICS.—MINCHIN, Statics, Vol. II., selected chapters; WILLIAMSON and TARLETON, Dynamics; ROUTH Dynamics of a Rigid Body (for reference); BESANT, Hydro-Mechanics; PRESTON, Theory of Light; CUMMING, Theory of Electricity.

EXPERIMENTAL PHYSICS.—Course 8.

A special course for Graduates and Advanced Students will be delivered during the Session 1900-1901, by Professor Cox, at hours to be arranged. Subject—The Relations between Optics and Electricity.

Honour Courses.

(*c*) EXPERIMENTAL PHYSICS.

Third Year. 15. Courses 7, 8, (10 hours a week). Elements of the Calculus; Simple Differential Equations; Elements of Analytical Geometry, Elementary Dynamics of a Particle; Elementary Rigid Dynamics.

Fourth Year. 16. Advanced Courses in Heat, Optics and Electricity. A short course in Physical Chemistry.

Chemistry.

Professors:—B. J. Harrington, M. A., Ph.D., LL.D.
J. Wallace Walker, M.A., Ph.D.
Lecturer:—Nevil Norton Evans, M.A.S.
Demonstrators:—James Henderson, B.Sc., Ph.D.

Second Year. 1. GENERAL CHEMISTRY.—A Course of lectures on Elementary Chemical Theory, and on the principal elements and their compounds. The lectures are fully illustrated by means of experiments.

Text-Book.—REMSEN'S Introduction to the Study of Chemistry.

Three hours a week.

ELEMENTARY PRACTICAL CHEMISTRY.—This course is compulsory for all undergraduates taking the above course of lectures. The work includes experiments illustrative of the Laws of Chemical Combination, the Preparation of Pure Chemical Compounds, and elementary Qualitative Analysis.

Six hours a week.

Third Year. 2. INORGANIC CHEMISTRY.—An elementary course on the more important Chemical Industries.

Two hours a week during the first term, and one during the second.

3. Elementary Organic Chemistry.—An elementary course of lectures on Organic Chemistry for Biological Students and for students intending to take Organic Chemistry in the Fourth Year.

Two hours a week during the second term.

4. Advanced Practical Chemistry.—Laboratory practice in methods of gravimetric, volumetric and electrolytic Quantitative Analysis.

Note.—The Organic Laboratory will be open during the Second Term for Biological Students who desire to obtain an elementary knowledge of the methods employed in preparing organic substances.

Fourth Year.

5. Organic Chemistry.—A systematic course of lectures on Organic Chemistry, including the Analysis of Organic Substances, Calculation of Formulae, Determination of Molecular Weights, Polymerism, Isomerism, etc., followed by a discussion of the more important derivatives of the Fatty and Aromatic Series of Compounds. Students intending to enter the Medical Faculty would find this course of great advantage.

Two hours a week.

6. Practical Organic Chemistry.—A complete course on the preparation and analysis of Organic Substances, with determinations of Molecular Weights, etc.

7. Physical Chemistry.—The lectures on Physical Chemistry are divided into two parts. In the first term they include a study of such physical properties of gases, liquids and solids as are known to depend upon their Chemical Constitution. Thermo-Chemistry and the Law of Mass Action. The second term is devoted to Electro-chemistry. The lectures will be based upon the application of the gaseous laws to solutions.

8. Practical Physical Chemistry.—Laboratory work will include the various methods of determining the Molecular Weights of gases and of substances in solution, accurate measurements of densities, refractive indices, surface tensions, and specific rotations; also examples of chemical statics and kinetics, and electro-chemical measurements.

9. Mineral Analysis.—A course of laboratory work comprising advanced quantitative analysis and investigation of the constitution of mineral species.

Honour Courses. Third Year.

(1) Chemistry; (2) Experimental Physics (Course 7); (3) Mechanics (Course 4); (4) Differential and Integral Calculus (4 hours a week

for first half of second term or 2 hours a week for whole term), with Biology, or Geology, or Mineralogy.

Fourth Year. (1) Chemistry (Organic and Physical); (2) Experimental Physics (Course 8).

Mineralogy.

Professor:—B. J. Harrington, M.A., Ph.D.
Demonstrator:—

Honours. Third Year 1. MINERALOGY.—Lectures and demonstrations illustrated by models and specimens in the Peter Redpath Museum and the Macdonald Chemistry and Mining Building. Among the subjects discussed are: Crystallography; physical properties of minerals dependent upon light, electricity, state of aggregation, etc.; chemical composition, calculation of mineral formulæ, quantivalent ratios, etc.; principles of classification, description of species.

Two hours a week.

Fourth Year. 2. MINERALOGY (In continuation of No. 1).—Description of species, particular attention being paid to those which are important as rock constituents and to the economic minerals of Canada.

First term, two hours a week.

Third Year 3. DETERMINATIVE MINERALOGY.—Laboratory practice in blowpipe analysis and its application to the determination of mineral species. This work is carried on in the new laboratory provided for the purpose in the Chemistry and Mining Building.

Thursday, 2 to 5 p.m.

Elementary Biology.

Professors:—D. P. Penhallow, M.Sc.
E. M. MacBride, M.A., D.Sc.

Second Year. Elementary Biology. 1. This course is designed for those who may wish an introduction to the principles of general biology, but who cannot carry such work beyond the limits of an elementary course; for students in Arts proceeding to Medicine, and also for those who may wish to take the more advanced work of the Third and Fourth Years to which it will be introductory.

a. ZOOLOGY.—First half-session.—This course will comprise the study of a selected number of types leading up to and including the rudiments of vertebrate anatomy, and forming an introduction

to the more systematic work of the Third and Fourth Years. The types selected for 1900-1901, will include Amœba, Hydra, Lumbricus, Scyllium and Rana.

b. Botany.—Second half-session.—This course will comprise a number of type studies, commencing with the lowest forms of life and including one of the Gymnosperms. It will deal with the general structure of the plant body; the differentiation of organs; the principles of movement, nutrition, respiration and fixation of carbon, the evolution of plant forms, and the general relations of plants to animals.

For 1900-1901, the types will include a myxomycete, Rivularia, Spirogyra, Pleurococcus, Oedogonium, Fucus, Umbilicaria, Agaricus, Mnium, Pteris, Lycopodium, Pinus or Larix.

This course will form the basis of more extended studies in the Third and Fourth Years.

Two lectures and two laboratory periods each week.

Botany.

Professor:—D. P. Penhallow, M.Sc.
Lecturer:—C. M. Derick, M.A.

Ordinary Second Year.

1. Plant Biology. (See above *b*).—This course is introductory to the more advanced work of the Third and Fourth Years, and will be represented by a number of types as far as and ing one of the Gymnosperms.

Two lectures and two laboratory periods each week.

Ordinary Third Year.

2. Special Morphology.—This course is designed to give a comprehensive knowledge of the structure of plants, their relationships and the principles of development as illustrated by type forms. Attention will also be given to the ecological relations of plants as indicated by special structural modifications.

This work will serve as the basis of more special studies in the various groups represented, of the work of the Fourth Year and of special studies in Bacteriology, Physiology and Palaeo-botany.

For 1900-1901, it will comprise:

a. *Introductory.*—The construction of the microscope; determination of amplifications; micrometry; drawings; section cutting; preparation of microscopic objects.

This part of the work presupposes familiarity with the optics of the microscope as given in Physics (3) of the Second Year.

b. Critical studies of the Thallophyta, Bryophyta, and Pteridophyta as illustrated by a Myxomycete, Diatoms, Chroococcus, Nostoc,

Rivularia, Bacteria, a Desmid, Spirogyra, Pleurococcus, Volvox; Oedogonium, Vaucheria, Chara, Fucus, Nemalion, Rhizopus, Eurotium, Umbilicaria, Puccinia, Agaricus, Anthoceros, Mnium, Pteris, Equisetum, Lycopodium, Selaginella.

Comparisons with other members of the various groups will be made as far as time permits.

Two lectures and two laboratory periods each week.

This course will be open to all students of the Third Year during the session of 1900-1901, after which the Elementary Biology of the Second Year will be required as a basis.

Ordinary Fourth Year.

3. For the session of 1900-1901, the work of the Fourth Year will be a continuation of, and open to all students who have satisfactorily completed the work of the previous year. The course will include critical studies of the Thallophyta, Bryophyta and Pteridophyta, together with special readings on Biological problems. The following types will be studied:—A Myxomycete, Diatoms, Chroococcus, Nostoc, Rivularia, Bacteria, a Desmid, Spirogyra, Pleurococcus, Volvox, Oedogonium, Vaucheria, Chara, Fucus, Nemalion, Rhizopus, Eurotium, Umbilicaria, Puccinia, Agaricus, Anthoceros, Mnium, Pteris, Equisetum, Lycopodium, Selaginella.

Comparisons with other members of the various groups will be made as far as time permits.

Two lectures and two laboratory periods each week.

For the session of 1900-1901, the work of the Fourth Year will be taken at the same time as that of the Third Year.

Honour Course in Biology.

Honours. Third Year.

[For the Zoological part of this course, see p. 101.]

4. Students electing Honours in the Third Year, will, in addition to the ordinary work of that year, take a special course of reading under the direction of the professor, who will hold a colloquium once a week for the purpose of giving direction and advice in such work.

For 1900-1901, the special readings will comprise

Campbell, **Evolution of Plants.**

Vines, Physiology of Plants, together with such special memoirs as may be selected.

One hour each week.

Honours, Fourth Year.

5. For the session of 1900-1901, students electing Honours in the Fourth Year will take the same readings as, and together with the Third Year.

One hour each week.

It is anticipated that for the session of 1901-1902, provision may be made for a special course in experimental Plant Physiology, either as a part of the Honours work, or as post-graduate work.

Zoology.

Professor:—Ernest William MacBride, M.A., D.Sc.
Demonstrator:—F. Slater Jackson, M.D.

Ordinary Second Year.

1. Animal Biology [see Biology, p. 98].—This course includes a careful study of certain selected types leading up to and including a knowledge of the fundamental principles of vertebrate structure. It forms part of the course on General Biology.

   Two lectures and two demonstrations a week during the autumn term.

Ordinary Third Year.

2. Elementary Zoology.—This course consists of a general survey of all the principal types of structure met with in the animal kingdom. Special attention will be paid to living representatives of those groups, which are largely represented in the fossil record, in order to prepare students for an intelligent study of Geology. In the winter term (New Year till Easter), a number of vertebrate types will be dissected and a study made of the principle features of vertebrate osteology as illustrated by the skeletons in the collection of the Redpath Museum.

   In the near future, a knowledge of the course in Animal Biology will be assumed in the case of students electing to take Zoology in the Third Year. In the session 1900-1901, however, arrangements will be made to enable students taking Zoology for the first time to make themselves acquainted with the work done in the Second Year.

   Two lectures and two demonstrations a week throughout the session.

Honour Course in Biology.

[For the Botanical portion of this course see p. 100.]

Honours: Third Year.

3. During the Third Year students pursuing the Honours course in Biology will take the ordinary work, and, in addition, will be expected to pursue a course of reading. The professor will, once a week, hold a colloquium in order to give direction and advice in this course.

   The books required for the session 1900-1901 will be:

   Darwin. Origin of Species.

   Verworn. General Physiology (English edition).

   One hour a week.

Honours. Fourth Year.

4. A special Honours course will be given during the Fourth Year. This will include:

(*a*). A study of those of invertebrate groups not dealt with in (3)—specially of those which are of interest on account of their parasitic habits and their relation to disease.

(*b*) A study theoretical and practical of Embryology and Organogeny, combined with a discussion of the most prominent disputed questions in Zoological Scienee.

During the session 1900-1901 the course will also include a study of Vertebrate Osteology as in former years.

In addition, the following course of extra reading will be required, viz.:—

WALLACE.—Island Life.
WOODWARD.—Vertebrate Palaeontology.

A short weekly essay on some selected point will be likewise expected.

Two lectures and two demonstrations a week throughout the term.

N.B.—No student is permittted to attend the lectures without taking the practical work. Under the regulations of the new curriculum, the special fee for the use of the laboratory is abolished, but the sum of $2.50 is exacted from each student in order to cover the cost of the class-book and some other necessaries which are supplied to him, and become his property. This sum need only be paid once; if the student attends a second course in the department it is not required.

Geology.

Professor:—Frank D. Adams, M.A.Sc., Ph.D.
Demonstrator:—Osmond E. Leroy, B.A.

Ordinary Third Year. (Fourth Year, Old Curriculum)

1. GENERAL GEOLOGY.—The lectures will embrace a general survey of the whole field of Geology, and will be introduced by a short course on Mineralogy. Especial attention will be devoted to Dynamical Geology and to Historical Geology including a description of the fauna and flora of the earth during the successive periods of its past history.

The lectures will be illustrated by the extensive collections in the Peter Redpath Museum, as well as by models, maps, sections and lantern views. There will be an excursion every Saturday until the snow falls, after which the excursion will be replaced by a demonstration in the Museum.

Text-Book.—SCOTT, An Introduction to Geology. *Books of Reference.*—DAWSON, Hand-Book of Geology; DANA, Manual of Geology.

Three hours a week throughout the year, with additional excursions and demonstrations as above stated.

Honours Course in Geology and Mineralogy.

[For Mineralogical portion of this course see p. 98.]

In the Third Year, students pursuing the Honours Course will take the Ordinary work (General Geology, 1).

In the Fourth Year they will take following courses (2, 3, 4, 5 and 6).

Honours. Fourth Year.

2. Petrography.—The modern methods of study employed in Petrography are first described, and the classification and description of rocks is then taken up.

One lecture a week during the first term. One afternoon a week throughout the year will be devoted to special microscopical work in the Petrographical Laboratory.

Text-Book.—Harker, Petrology for Students.

Books of Reference.— Rosenbusch, Mikroskopische Physiographie, and Rutley, Rock-forming Minerals.

3. A. Palæontology.—An extension of the Palæontology of Course 1, with special studies of some of the more important groups of fossils.

One lecture a week during the second term and one demonstration a week, with special studies in the Peter Redpath Museum.

Books of Reference.—Nicholson and Lydekker, Manual of Palæontology; Zittel, Text-Book of Palæontology.

or,

3. B. Physiography.—Adescription of Land Forms with reference to classification, drainage development and climatic control.

Special attention will be paid to the influence of Geographical factors in the history of man. The physical features will be taken up during the latter half of the course.

One lecture and one demonstration a week during the second term.

In the session of 1900-1901, course 3 B., but not 3 A., will be given.

4. Practical Geology and Ore Deposits.—A description of the methods employed in carrying out Geological Surveys, and in preparing Geological Sections. Special Studies in folding, faulting, etc., concluding with a general treatment of the nature and mode of occurrence of Ore Deposits.

One lecture or demonstration a week throughout the year.

Text-Books.—Geikie, Outlines of Field Geology; Kemp, Ore Deposits of the United States. Phillips and Louis, A Treatise on Ore Deposits.

Honours. Fourth Year.

5. CANADIAN GEOLOGY.—A general description of the Geology and Mineral Resources of the Dominion.

One lecture a week during the second term.

Text-Book.—DAWSON, Hand-book of Geology.

Books of Reference.—The Reports of the Geological Survey of Canada.

6. GEOLOGICAL COLLOQUIUM.—A discussion each week of some Geological topic, references to the literature of which have been given by the Professor in the week preceding. The course is intended to give students some acquaintaince with Geological literature, as well as a wider knowledge of the great principles which underlie the Science.

One hour a week in second term.

N.B.—A large amount of additional private reading will also be required of Candidates for Honours.

Students taking any of these courses are entitled to tickets of admission to the Museum of the Natural History Society of Montreal.

COURSE FOR B.A. HONOURS IN GEOLOGY AND MINERALOGY.

THIRD YEAR.—GEOLOGY (ordinary of Third Yer.
MINERALOGY.
ZOOLOGY (ordinary of Third Year).
CHEMISTRY (of Second or Third Year).

FOURTH YEAR.—GEOLOGY (Advanced)—(Lectures, Lab. work, Colloquium, Reading.)
MINERALOGY (Advanced).
BOTANY (ordinary of Third Year).
SURVEYING.

Economics and Political Science

Lecturers:

Professor James E. LeRossignol, M.A. (McGill), Ph.D. (Leipzig), of the University of Denver, Colorado.

During the session 1900-01 a full course will be given in the above department, counting as an option in the Third or Fourth Year of the new undergraduate curriculum for the degree of B.A. The course will be open also to Partial Students and others.

Alternatively, each subject may be taken as a half-course—Economics up to Christmas, and Political Science from January to the end of March.

Third or Fourth Year.

1. ECONOMICS.—Scope and method of Economic Science; history of economic theory; public and private wealth; consumption, production and distribution of wealth; theory of value; theory of rent; interest and profits; wages; money and credit; combinations of employers and of labourers; speculation; transportation; commercial development and generally the industrial organization of society.

Text-books and Books of Reference:—Hadley's Economics and Ingram's History of Political Economy; Bullock's Introduction to Political Economy; Gide's Principles of Political Economy; Marshall's Principles of Economics, Macleod's Elements of Economics; Macfarlane's Value, Price and Distribution; Cohn's History of Political Economy.

Following the half course on Economics will come a second half course on POLITICAL SCIENCE as under:—

2. POLITICAL SCIENCE.—The general principles of Political Science, its province and problems; relations to the social and economic sciences; origin of government and law; history of early institutions; the village community; growth of the British Constitution and English liberties; revolutions; written constitutions; democracy in England, America and France; protection and free trade; bi-metallism, wages, railways, municipal ownership, trusts, economic crises, anarchy and socialism, international relations.

Text books and Books of Reference:—Wilson's The State; McKechnie's The State and the Individual; Woolsey's Political Science; Lowell's Government and Parties in Continental Europe; Dilke's Problems of Greater Britain; The Statesman's Year Book, with references to the current literature of the subject.

Four hours a week.

Roman Law.

Professor:—F. P. Walton, B.A., B.C.L.

1. A Course is offered in Roman Law, open to Third and Fourth Year students in Arts, and qualifying as an option for the B.A. degree. For details, see p. 201.

Art (History of) and Archaeology.

S. Henbest Capper, M.A., Macdonald Professor of Architecture.

The complete course will be comprised in two sessions, a half course of fifty lectures being given each session.

1. For Session 1900-1901 the subjects included will be as follows:—
(1). The origins of art and the sources of artistic expression, with

special reference to materials and technical processes and the limitations these impose.

(2). A survey of the history of architecture, sculpture, painting, and the industrial arts in the ancient world: Egypt; Assyria; Greece; Rome.

(3). Outlines of the topography and archaeology of Greece and Rome, more especially Athens; Olympia; Rome; Pompeii.

The lectures will be delivered in the Architecture Class-room, Engineering Building, on Mondays and Thursdays, at 3 p.m. They will be illustrated by lantern slides, casts, photographs, diagrams, etc.

Text-books.—Baldwin Brown, "The Fine Arts" (Murray, Scribner); Hamlin, "History of Architecture" (Longmans); Upcott, "Introduction to Greek Sculpture" (Clarendon Press).

Reference Books.—Perrot & Chipiez, Histoire de l'Art dans l'Antiquité; Murray, Handbook of Greek Archaeology; E. Gardner, Handbook of Greek Sculpture; Lanciani, Ruins and Excavations of Ancient Rome.

Meteorology.

Superintendent of Observatory:—C. H. McLeod, Ma.E.

Instruction in Meteorological Observations will be given in the Observatory at hours to suit the convenience of the senior students.

Certificates will be granted to those students who pass a satisfactory examination on the construction and use of meteorological instruments and on the general facts of Meteorology.

Pedagogy.

Principal of the Normal School:—S. P. Robins, M.A., LL.D.

Lectures on this subject will be given in the Normal School to undergraduates of the Third and Fourth Years, who wish to obtain the Provincial Academy Diploma.

Lecture hours, 3 to 4 p.m., Tuesdays and Fridays.

Physical Culture.

Medical Examiner and Instructor:—R. Tait McKenzie, B.A., M.D.

The classes will meet at the University Gymnasium at hours to be announced at the commencement of the Session. The Wicksteed Silver and Bronze Medals (the gift of Dr. R. J. Wicksteed) are offered for competition to students of the Graduating Class and to students who have had instruction in the Gymnasium for two sessions,—the silver medal to the former, the bronze medal to the latter. (See p. 35.)

VIII. LABOR ATORIES.

The Macdonald Physical Laboratories

The equipment of the Macdonald Physical Building Laboratories comprises: (1) apparatus for illustrating lectures; (2) simple forms of the principal instruments for use by the Students in practical work; (3) the most recent types of all important instruments for exact measurement, to be used in connection with special work and research.

The basement contains the cellars, furnaces, and janitor's department at the west end of the building. The machine room—containing a small gas engine and dynamo, which are fitted for testing, but can also be used for light and power, a motor-alternator and a motor-dynamo—is situated at the extreme western corner of the basement so as to be as far removed as possible from the delicate magnetic and electrical instruments. Here is also the switch board for controlling the various circuits for supplying direct or alternating current to different parts of the building. The Accumulator Room contains a few large storage cells, charged by the motor-dynamo, which are fitted with a suitable series-parallel arrangement and with rheostats for obtaining and controlling large currents up to 4,000 amperes for testing ammeters and low resistances, etc.

The Magnetic Laboratory contains magnetic instruments and variometers of different patterns, and also a duplicate of the B. A. Electro-dynamometer, which has been completely remodelled and set up with great care for absolute measurements of current. The Laboratory, on the opposite side of the basement, contains a very fine Lorenz apparatus for the absolute measurement of resistance, constructed under the supervision of Prof. Viriamu Jones. It also contains a set of Ewing Seismographs and a pair of Darwin Recording Mirrors for measuring small movements of the soil.

There is a Constant Temperature Room, surrounded by double walls, which contains a Standard Rieffler Clock, and is fitted for comparator work.

The ground floor contains at the western corner a small machine shop, fitted with a milling machine and suitable lathes and tools, driven by electric motors, and such appliances as are required for the making and repairing of the instruments, for which the services of a mechanical assistant are retained. There is also a store room for glass, chemicals and cleaning materials, and extensive lockers and lavatories for the use of the students.

The Main Electrical Laboratory is a room 60 feet by 40, and is fitted with a number of brick piers, which come up through the floor, and rest on independent foundations, in addition to the usual slate shelves round the walls. This room contains a large number

of electrometers, galvanometers, potentiometers and other testing instruments of various patterns, and adapted for different uses. It connects with a smaller room at the side, in which are kept the resistance boxes and standards, and also the capacity standards. A small research laboratory, adjoining the electrical laboratory, is fitted up for the study of electrical discharge in high vacua, and for work with Röntgen and uranium radiation, and with ultra-violet light.

The First Floor contains the Main Lecture Theatre, with seats for about 250 students. The lecture table is supported on separate piers, which are independent of the floor. Complete arrangements are provided for optical projection and illustration. The Preparation Room in the rear contains many of the larger pieces of lecture apparatus, but the majority of the instruments, when not in use, are kept in suitable cases in the adjoining apparatus room. On the same floor there is the Heat Laboratory, devoted to advanced work in Thermometry, Pyrometry and Calorimetry, and also to such electrical work as involves the use of thermostats and the measurement of the effects of temperature. There are also two smaller rooms for Professors and Demonstrators.

The Second Floor is partly occupied by the upper half of the Lecture Theatre. There is also an Examination Room for paper work, a Mathematical Lecture Room, with a special apparatus room devoted to apparatus for illustrating Mathematical Physics, and a special Physical Library chiefly devoted to reference books and periodicals relating to Physics. A store room, lavatories and Professors' Room occupy the remainder of the flat.

The Third Floor contains the Elementary Laboratory, a room 60 feet square, devoted to elementary practical work in Heat, Sound and Electricity and Magnetism. There is a Demonstrator's room adjoining, and an optical annex devoted to experiments with lenses, galvanometers, etc., which require a darkened room. On the other side of the building there is a spectroscopic room containing a six-inch Rowland grating, with mountings by Brashear, and other large spectrometers and polarimeters. Also a series of smaller optical rooms, including a photometric room, specially fitted for Arc photometry, and a dark room for photographic work. Communication between the different flats is facilitated by means of a hydraulic elevator. The building is lighted throughout by electricity, and heated by hot water. The walls are of pressed brick, and the floors of hard maple. There is a ventilating system, consisting of Tobin tubes and suitable exit flues, assisted by a fan in the roof.

The Macdonald Chemical I aboratories

The main lecture-theatre, extending through two stories, is entered from the ground floor, and seats nearly 250 students. The lecture-table is supplied with coal-gas, oxygen and hydrogen, electricity, water, vacuum, down-draught, etc., and can be well seen from all parts of the room.

Besides the main lecture-theatre there are three smaller class-rooms, accommodating from 40 to 60 students each.

The three principal laboratories have each a floor-space of about 2,400 square feet, and together have accommodation for nearly two hundred students working at a time. They are lighted on three sides, and have ample hood space. One is intended for beginners, and the others for more advanced work, more particularly in qualitative and quantitative analysis. In connection with each of the main laboratories is a balance-room, equipped with balances by several of the best makers.

Physical Chemistry is provided for in a special laboratory, nearly 30 by 40 feet, lighted from the north, and supplied with electricity, steam, vacuum pumps, etc. The equipment of this department consists of the apparatus necessary for the determination of the specific gravities of solutions, of the depression of freezing point, and the rise of boiling point, of the densities of gases and vapours. There are constant temperature baths for accurate measurement of solubilities, Kohlrausch's apparatus for determining the electrical conductivity of solutions, and the apparatus necessary for measuring the electromotive forces generated between metals and their solutions, and in voltaic cells generally. There are also calorimeters for measuring the heat effects produced in chemical reactions. There is on the same floor an optical room furnished with refractometers for measuring the refractive indices of solutions, goniometers, polariscopes and spectroscopes. Other forms of apparatus will be added as required for research work.

Immediately adjoining the laboratory of Physical Chemistry is the Photographic department, supplied with two dark rooms, arranged on the maze system, and supplied with the necessary appliances for all ordinary photographic work, including an enlarging camera. Apparatus for micro-photography will shortly be added to the equipment.

The laboratory for Gas Analysis has a northern exposure, and is fitted with a large tank, to contain water at the temperature of the room, for use in the measurement of gases. The tables are arranged for work with mercury, and the laboratory is supplied with the apparatus of Hempel, Dittmar, Orsat, Elliot, and others. It

contains also Fleuss, Boltwood and Töpler pumps for providing high vacua.

The laboratory for Electrolytic Analysis is supplied with accumulators, thermopile, platinum electrodes, rheostats, ammeters, voltmeters, etc.

Another room is shortly to be equipped with electric furnaces and other appliances for electro-chemical work.

The Organic Department comprises a laboratory for preparations and research, a combustion room for analysis, a dark room for polariscope and saccharimeter work, and a lecture room. The laboratory is fitted with all the necessary apparatus for organic research—special hoods for work with poisonous gases, regulating ovens for digesting and drying at various temperatures, filter presses for the extraction of raw materials, and various forms of apparatus for distillation in vacuo. The dark room is equipped with polariscopes and saccharimeters for sugar work. There is a large quantity of the necesary organic chemicals, which are supplied free of charge to students engaged in routine or research work in this department.

The laboratory for Determinative Mineralogy has places for 28 students, and is supplied with abundant material for practical work. It adjoins the lecture-room, in which the lectures on advanced mineralogy are delivered. The mineralogical department is also provided with suitable machinery, run by electricity, for cutting and polishing minerals.

The Library contains a valuable collection of the most recent English, French and German books, and sets of various journals and transactions, including the Berichte der Deutschen Chemischen Gesellschaft, Journal für praktische Chemie, Chemisches Central-blatt. Fresenius' Zeitschrift für Analytische Chemie, Annales de Chimie et de Physique, Journal of the Chemical Society, Chemical News, Mineralogical Magazine, Mineralogische und Petrographische Mittheilungen, etc. The library is open to students under such restrictions as are necessary to prevent damage or loss of books.

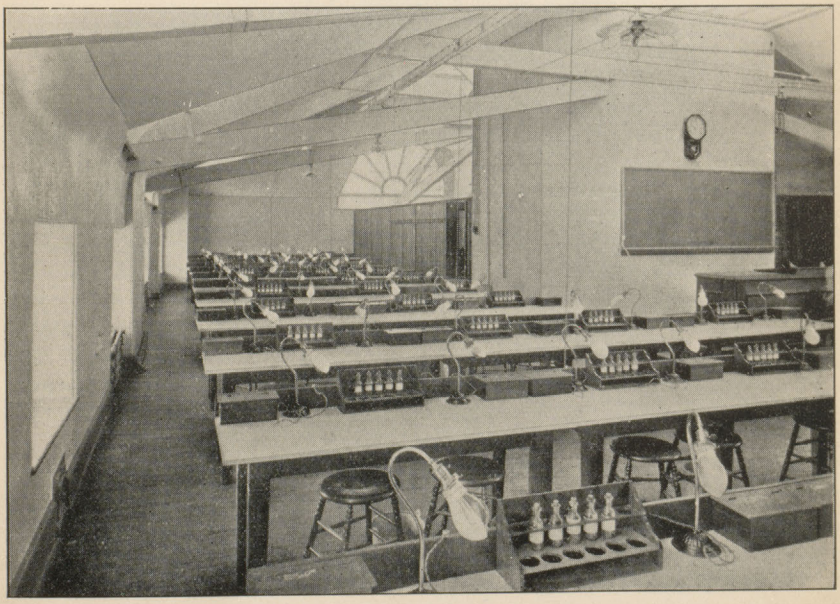
The rooms for allied purposes have, as far as possible, been grouped together on the same floor, and there is a hydraulic lift running from the basement to the attic. The offices and principal laboratories and supply rooms are also connected by a system of telephones. The building is practically fire-proof.

Botanical Laboratories.

The Botanical Laboratories occupy the upper floor of the central Arts building.

The laboratory for general Morphology provides table accommodation for fifty students, and is equipped with all the necessary appliances for the practical study of plants, either fresh or dry.

In the Botanical Laboratories



In the Zoological Laboratories.

In connection with this laboratory, a large collection of dried plants is maintained, from which material is drawn for practical work.

Each student is supplied with a dissecting microscope, which he is required to return in good order at the close of the session.

The laboratories for special Morphology at present afford accommodation for twenty-four students. Each table is provided with a complete outfit of instruments and reagents. Provision is also made for accurate micrometric work, and for the production of accurate drawings by means of the camera lucida and Leitz's drawing instrument. More special instruments, including polariscope, spectroscope and photographic apparatus, afford opportunity for detailed studies in these several directions.

Ample provision for material of all kinds is found in the resources of the Botanic Garden, and in a large supply of stock preparations.

An investigator's table held by the University at the Biological Laboratory, Wood's Hall, Massachusetts, is available for such students as may successfully complete the advanced course of the Third and Fourth Years.

Botanic Garden.

The Botanic Garden occupies a commanding situation at the summit of the Cote des Neiges Hill, distant from the College about one and one-half miles, and comprises an area of about nine acres.

The conservatories embrace a continuous series of houses having a total ground area of 4,600 square feet. They include a camellia house, 20 x 60 feet; a mixed stove, 20 x 80 feet; a greenhouse, 20 x 60 feet; and an Australian house, 20 x 30 feet.

The collection comprises an important and somewhat extensive representation of Australasian plants, and type-forms of vegetation from various parts of the world.

During the winter material for practical study is provided in large quantity to meet the requirements of the College and of such of the City schools as may have acquired special privileges in this respect.

Students are admitted to the garden and allowed the use of material for practical study, under special conditions. For this purpose, students' tickets are issued at the opening of the session to all those taking the course in Botany.

The public are admitted to the garden without charge, every day, except Sunday.

Zoological Laboratories.

The Zoological Department occupies the whole of the uppermost floor of the east wing of McGill College and the larger portion of the floor immediately below this one.

It consists of:

(*a*). A large laboratory affording accommodation for a class of 90 students.

(*b*). A smaller laboratory capable of seating about 18 students.

(*c*). Three smaller laboratories fitted up for purposes of research.

(*d*). A room fitted up for the University Osteologist.

Dissecting trays, simple and compound microscopes, reasonable quantities of the ordinary reagents and of glass are provided by the department, but students must provide themselves with dissecting instruments, and with razors.

The Department is provided with four large tanks and a number of smaller ones in order to maintain a supply of fresh specimens throughout the winter.

The subjects for practical work, are, so far as possible, selected from species inhabiting the vicinity of Montreal.

The laboratories are well provided with thermostats, microtomes, and other instruments required for advanced research. There is also a small library attached to the department.

Petrographical Laboratory.

The Petrographical Laboratory, containing the chief rock collections of the University, is situated in the Macdonald Chemistry and Mining Building, and is arranged for the use of Honour and Graduate students. It is provided with a number of petrographical microscopes by Seibert and Crouch, as well as with models, sets of thin sections, electro-magnets, heavy solutions, etc., for petrographical work.

For purposes of study and comparison, in conection with advanced work and petrographical investigation, Dr. Adams' extensive private collection of rocks and thin sections is available.

TIME TABLE—FACULTY OF ARTS.

YEARS	HOURS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
FIRST YEAR.	9	Latin.	Mathematics.	Mathematics.	Greek.	Mathematics.	
	10	Mathematics.	Greek.	Latin.	French.	Greek.	
	11	French.	German.	German.	German.	English.	
	12	Physics.	French.	English.	Latin.	Physics.	
	2	Greek.	English.	French.		Latin.	
	3					German.	
SECOND YEAR.	9	German. Hebrew.	Logic.	English.	German. Hebrew.	German. Hebrew.	Biology.*
	10	Greek.	German. Hebrew.	French.	Logic.	Mathematics	Biology.
	11	Mathematics.	Chemistry.	Latin.	Latin.	Greek.	Biology.
	12	English.	Greek.	Chemistry.	English.	Chemistry.	
	2	Latin.	Biology.*	Logic.	Greek.	Latin.	
	3	French.	Biology.	Mathematics.	French.		
	4		Biology.				
	5		French.				

* Zoology, first term; Botany, second term.

Hours of Laboratory Work for the Classes in Chemistry and Biology (2 periods a week each) will be arranged to suit the convenience of Classes.

TIME TABLE—FACULTY OF ARTS.

THIRD AND FOURTH YEARS.

HRS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
9	Botany. Anatomy. English. Mathematics. Physics (*B*)	Zoology. Anatomy. Sanskrit (Adv) Ast. (*a*) Opt. (*b*)	Geol. Anat. History. Greek.	Anatomy. Latin.	Zool. Anatomy. Sanskrit (Adv) Mechanics (*a*) Ast.(*a*) Opt.(*b*) Hist.of Philos.	Chem. (*L*) Prac. Anat.
10	Geology. Prac. Anat. History. Greek.	Prac. Anat. Latin.	Prac. Anat. Latin.	Bot. Prac. Anat. English. Math. Physics (*B*)	Geol. Prac. Anat. History. Greek.	Chem. (*L*) Phys. (*L*) Prac. Anat.
11	Prac. Anat. Hebrew. German.	Prac. Anat. Hebrew. German. Chem. (Pædagogy.)†	Prac. Anat. Mechanics Comp. Philol. Hist. of Philos.	Chem. Prac. Anat. Hebrew. German.	Prac. Anat. Hebrew. German. (Pædagogy.)†	Geol. Prac. Anat. History.
12	Prac. Anat. Moral Phil. French.	Prac. Anat. Moral Phil. French. Physics (*A*)	Prac. Anat. Comp. Eng. 3, 4	Prac. Anat. Moral Phil. French. Physics (*A*)	Prac. Anat. Moral Phil. French.	Geol. Prac Anat.
2	Zool. (*L*) Physiol. (4) Histol. (3) Sanskrit (Adv) Mechanics. Hist.of Philos.	Bot. (*L*) Physi. Prac.(4) English. Math. Physics [*L*]	Chem. (*L*) Physiol. (4) Greek.	Zool. (*L*) Physiol. Prac.(4) Sanskrit (Adv.)	Bot. (*L*) Physiol. (4) Eng. Math. Physics (*L*)	
3	Zool. (*L*) Histol. (3) Sanskrit (Elem.)	Bot. (*L*) Physi. Prac.(4) Comp. Philol. Hist.of Philos. Physics (*L*)	Chem. (*L*) Physiol. Prac.(3)	Zool. (*L*) Physiol. Prac.(4) Sanskrit (Elem.)	Bot. (*L*) Latin. Physics (*L*)	
4	Art. and Arch. Physiol. (3) Logic & Met. Roman Law.	Physiol. (3) Logic & Met. Roman Law.	Physiol. Prac.(3) Roman Law.	Art. and Arch. Physiol. (3) Logic and Met. Roman Law.	Histol. (3) Logic & Met. Rom. Law (*b*) Const. Law (*a*)	
5	Pol. Econ. Const. L. & H.	Pol. Econ. Const. L. & H.	Histol.	Pol. Econ. Const. L. & H.	Pol. Econ. Histol. (3) Const. L. & H.	

Physics (*A*) Heat, Light and Sound,
" (*B*) Electricity and Magnetism.
(*L*) Laboratory.
(*a*) During First Term.
(*b*) During Second Term.
† Normal School Class.

FACULTY OF ARTS.

MATRICULATION, EXHIBITION, SCHOLARSHIP AND SUPPLEMENTAL EXAMINATIONS, SEPTEMBER, 1900.

DATE.	Hour.	Matriculation.	First Year Exhibitions.	Supp. to First Year Sessional.	Second Year Exhibitions.	Supplemental to Intermediate.	Scholarships (Third Year).	Supp. to Third Year Sessional.
Mon. 17	9	Latin Books and Sight Translation.	Latin Books and Sight Translation.	Latin Books.	Latin Books and Sight Translation.	Latin Books.	Latin Books; Math. (Anal, Geom (1))	Latin Books.
	2	Latin Grammar and Composition.	Latin Gram., Composition, Higher Composition and Sight Translation.	Latin Composition, Sight Translation and History.	Latin Composition, Grammar and History.	Latin Composition, Sight Translation, History and Literature.	Latin Composition and Sight Translation.	Latin Composition, Sight Translation, History and Literature.
Tues. 18	9	Mathematics Pt. I (Euclid).	Mathematics Pt. I (Euclid I-IV).	Mathematics.	Mathematics, (Eucl., Alg., Trig.)	Mathematics.	Math. (Anal. Geom. (2)); Anc. History; Chem.	Mathematics.
	2	Mathematics Pt. I (Alg. and Arith.).	Mathematics Pt. I (Alg. and Arith.)	Mathematics.	Mathematics, (Geometry.)	Mathematics.	Greek Comp. and Sight Trans.	Greek Comp., Sight Trans., Hist. and Literature.
Wed. 19	9	English Grammar and History.	English Grammar.	English Literature, History and Composition.	English Literature (Spencer & Tennyson) & Composition	English Language, Literature and Composition; Logic	English Literature (Shakspere and Milton); Logic.	English.
	2	English Literature, Dictation and Composition.	English Literature (Scott, Shakspere and Milton).		Greek Books and Sight Translation.	Biology.	English Literature (Charles Lamb) & Composition; Chem	
Thurs. 20	9	French.	French.	French.	French.	French.	Math. (Calculus ; French; Chemistry	French; Botany.
	2	German.	German.	German.	German; Greek Composition, Grammar and History.	German ; Greek Composition, Sight Translation, History and Literature	German.	German.
Fri. 21	9	Mathematics Pt. II.	Mathematics Pt. II.	Physics.	Mathematics, (Theo. of Eq., Alg.)	Mathematics.	Mathematics, (Higher Alg., Trig.)	Mathematics.
	2	Elementary Nat. or Phys. Science.	English Literature (Macaulay) and Composition.		Modern History and English Language (Trench).	Chemistry.	Modern History, Chemistry.	
Mon. 24	9	Greek Books and Sight Translation.	Greek Books and Sight Translation.	Greek Books.		Greek Books.	Greek Books.	Greek Books.
	2	Greek Grammar and Composition.	Greek Gram., Composition, Higher Composition and Sight Translation.	Greek Composition, Sight Translation and History.				
Tues. 25	9		English Literature (Morley.)					

FACULTY OF ARTS

CHRISTMAS EXAMINATIONS, DECEMBER 1900.*

DAY.	DATE	FIRST YEAR.	SECOND YEAR.	THIRD YEAR.	FOURTH YEAR.
Monday.	17	Latin.	Latin.	Mechanics.	Astronomy.
"	17		M'matics, P.M.	German.	German.
Tuesday.	18	Greek.	Greek.	Greek.	Greek.
"	18		Biology, P.M.	Zoology, P.M.	Latin, P.M.
Wednesday.	19	Mathematics.	Psychology.	Latin.	Moral Philosophy.
"	19	French, P.M.	French, P.M.	Ment. Phil., P.M.	Geology, P.M.
"	20	Physics.	Chemistry.	Botany.	Botany.
Thursday.	20	German, P.M.	German, P.M.	French, P.M.	French, P.M.
"	20		Hebrew, P.M.		
Friday.	21	English.	English.		

* The Christmas Examinations are obligatory on all Students, and the standing gained therein may be taken into account by the Faculty at the close of the session. The results will be made known after the Christmas vacation.

FACULTY OF ARTS.

SESSIONAL AND HONOUR EXAMINATIONS, APRIL, 1901.

Date.	First Year.	Second Year.	Third Year.	Fourth Year.
April.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.
1 Mon.	Hebrew.....	Hebrew...Chemistry	Hebrew...Sanskrit	Hebrew...Sanskrit
2 Tues.	Greek.....Greek.	Greek.....Greek.	Mechanics	Ethics.....Ethics.
3 Wed.	Latin.....Latin.	Latin.....Latin.	Latin.....Latin.	Latin.....Latin.
4 Thurs.	English.....English.	English.....English.	Ex. Physics. English.	Ex. Physics. English.
5 Fri.	*Good Friday.*	.....	.....	.....
7 Sun.	*Easter Sunday.*	.....	.....	.....
10 Wed.	.....	Biology.....	Botany. Comp. Phil.	Botany. English
11 Thurs.	Geometry and Arithmetic....	Mathematics.....	Greek. .....Greek.	Greek.... Greek.
12 Fri.	Trigonometry and Algebra.....	Mathematics.....	Astronomy ..... Optics ..French.	Astronomy..... Optics ..French.
14 Sun.	.....	.....	.....	.....
15 Mon.	French. .....French.	French. .....French.	Metaphysics..... German.	Geology...Geology.
16 Tues.	German. ....German.	German. German.	Zoology.....	Mechanics .....
17 Wed.	Physics.....	Logic.....	French....German.	French....German.
18 Thurs.	Advanced Sections	Advanced Sections	Honour Exam'tions	Zoology...Zoology
19 Fri.	Advanced Sections	Advanced Sections	Honour Exam'tions	B. A. Honours.
21 Sun.	.....	.....	.....	.....
22 Mon.	Advanced Sections	Advanced Sections	Honour Exam'tions	B. A. Honours.
23 Tues.	Meeting of Examiners and Faculty at 9.30 A.M.			
24 Wed.	Meeting of Examiners and Faculty at 9.30 A.M.			
25 Thurs.		A.M. Meeting of Corporation P.M.		
30 Tues.	Convocation for Degrees.			

The days for Honour Examinations during April are arranged by the Examiners.
Days for subjects not mentioned in above table will be arranged during the session.

Royal Victoria College.

The institution of the Royal Victoria College, in September, 1899, was a direct continuation of the work begun in 1883, during the Principalship of the late Sir William Dawson, when Lord Strathcona and Mount Royal placed a sum at the disposal of the University of McGill, for the Endowment of a College and classes for women. For many years previously it had been hoped by those interested in the education of women in Montreal that the University would extend its benefits to women, but the means necessary for carrying out such an aim had not been available. The classes were organized in 1883 as a Special Course in the Faculty of Arts, held at McGill College, separate in the main from those for men, but under identical conditions. In some of the work of the Third and Fourth Years, and in the Honour and Additional Courses, the classes were held jointly.

The ultimate aim of Lord Strathcona had been the foundation of a place of residence, and, with this object, he announced his intention of building and endowing the Royal Victoria College. By the opening of this Institution the opportunity of residence and college life is given to women-students of McGill University, working in accordance with the system previously organized in the Special Course in Arts, but under greatly improved conditions. A share in the advantages of college life is offered also to the non-resident women-students of the University, who are henceforth also students of the Royal Victoria College. Fresh elements are added in the organization of a Musical Department, and in the institution of Resident Women Tutors. These additions are in accordance with the general aim of the College; viz., the

Royal Victoria College.

higher education of women, and mainly to qualify them to take degrees in Arts (including Pure Science), and to provide them with instruction in those branches of a liberal education necessary thereto and in such other subjects as may from time to time be determined.

The College being a residential College for the Women-Students of McGill University, its students, whether Undergraduates, Conditioned Students, or Partial, follow the courses in Arts and Pure Science offered by the University, (see pp. 66-106). Lectures are given by the Professors and Lecturers of the University, either in the College or in the University buildings, and students attend the University Laboratories for practical instruction. In addition to the instruction given in lectures and laboratory practice, the students of the Royal Victoria College are assisted in their studies by the Resident Tutors.

Exhibitions and Scholarships.

For a statement of the Exhibitions and Scholarships open to Women Students of the University, see pp. 37 *et seq.*

In addition to these, and further to encourage residence within the College walls of students who might otherwise arrange to board in the city, the Warden and Faculty are empowered to make nominations in any of the four College years to not more than three additional Exhibitons of the value of $100 each.

Music.

Apart from the University Courses, instruction in Music is offered at the College, for which a separate fee is charged. The instruction includes the Pianoforte in all its branches (solo, ensemble playing, concertos, duos for two pianofortes); Singing (voice production, vocalization, sight-singing, ear-tests, solo and part singing); and Lectures on Theory (elements of music, harmony, counterpoint, and history of music). Attendance at certain of these Courses is expected of all students of music.

Gymnasium.

The Gymnasium is in the charge of Miss Holmstrôm, graduate of the Posse Gymnasium, Boston, and of the Harvard Summer School, who teaches on Swedish principles. Special attention is devoted to the application of exercise in cases of physical weakness, Miss Holmstrôm having had considerable experience in the medical branch of her work. All students undergo a physical examination on entering upon the gymnastic course, under the superintendence of Dr. R. Tait Mackenzie, B.A., M.D., Assistant Lecturer in Anatomy at the University. Teams of Basket-Ball are formed, and, when weather permits, this and other exercises are practised on the lawn, at the back of the College building. This ground is also provided with lawn-tennis courts.

The College Building.

The College is situated on Sherbrooke Street, at the head of Union Avenue, in close proximity to the University buildings and to the slopes of Mount Royal. The building is fireproof, and much thought and artistic care have been given to the furnishing and decoration.

On the ground floor are the offices of the Administration, including the rooms of the Warden and Secretary, the Professors' common room, lecture rooms (English, French, German, Mathematics) and a spacious dining hall. On the first floor are other lecture rooms (Latin, Greek, Logic, and Philosophy), the library, reading-room, Students' common room, and a handsome assembly hall. On the second and third floors are the rooms of the resident students. These are of varying size and plan. Each student has a separate bedroom, and, as a rule, one sitting-room is shared by the occupants of the two or three bedrooms immediately adjoining. The entire use of a sitting-room can be obtained, and there are some rooms which may be used as study-bedrooms. The rooms are completely furnished, and no article of furniture need be brought by the students. No part need be taken by the students in the care of their rooms.

In addition to the lawn at the back of the College, the students are entitled to use, subject to regulations, the grounds of McGill University, with its tennis-courts, skating-rink, etc.

A nucleus of the College Library has been formed in a set of books, comprising the stated books and others referred to in connection with the University curricula, the modern language course being especially well represented. There are also works of general literature. The Library is a reading-room, and the books are not taken away; the students having access also to the University Lending Library.

Students of Music have the use of a large practising-room, and, at certain hours, of the piano in the common room, as also of the Gymnasium piano.

The Gymnasium, fully equipped in accordance with the requirements of the Swedish system, is in the basement. In connection with the Gymnasium there are bath-rooms and dressing-rooms.

The health of the students is under the charge of a competent physician practising in Montreal, who may be consulted free of charge.

Students of the Royal Victoria College, as students of McGill University, are entitled to the use of the University Library, containing about 70,000 volumes, and the Peter Redpath Museum containing large collections in Mineralogy, Palaeontology, Zoology, Botany, Archaeology, and Ethnology, and to work in the Physical, Chemical, Zoological, Botanical and other laboratories and the Botanic Gardens of the University. (For particulars of laboratories, etc., see University Calendar for 1900-1901, pp. 107 *et seqq.*)

Board and Residence.

Residence in the College buildings is open to Undergraduates, Conditioned Students, or Partial Students, but the last are not received in residence unless they take courses of study approved by the Faculty of the College. The expense of

board and residence ranges from $290 to $440 in addition to the sessional fees for tuition (see pp. 64, 65), according to the room or rooms occupied by the students; for a majority of the rooms the expense of board and residence is $290. These charges cover the University Session, 17th September; 30th April, and the summer classes, 30th April—29th June. A deduction of $50 is made in the case of Students who go out of residence at the end of the University Session.

Applications for admission or further particulars should be addressed to the Warden, Royal Victoria College, Montreal.

ROYAL VICTORIA COLLEGE.

TIME TABLE, SESSION 1900-1901.

EARS	HOURS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
FIRST YEAR.	9	Greek.	Physics.	French.	Greek.	Greek.	
	10	English.	English.	Greek.		Mathematics.	
	11	German.	Mathematics.	Latin.	English.	French.	
	12	Latin.	Latin.	Mathematics.	German.	Latin.	
	2	Mathematics.	French.	German.	French.	German.	
	3				Physics.		
SECOND YEAR.	9	Latin.	Greek.	French.	Latin.	English.	Biology.*
	10	German.	Chemistry.	Math.	English.	German.	Biology.
	11	English.	French.	Greek.	Mathematics.	Latin.	
	12	Logic.	Logic.	Latin.	German.	French.	
	2	French.		Chem.	Logic.	Chem.	
	3	Greek.		German.	Greek.	Mathematics.	
	4	Biology.					
	5						

* Zoology, first term; Botany, second term.

Hours of Laboratory Work for the Classes in Chemistry and Biology (2 periods a week each) will be arranged to suit the convenience of Classes.

FACULTY OF APPLIED SCIENCE.

DATES OF EXAMINATIONS AND COMMENCEMENT OF LECTURES.

The supplemental examinations in Surveying will be held on Friday, August 31st.

The supplemental examinations in Electrical, Mechanical and Practical Chemistry subjects of the Second and Third Years, will be held on Monday, September 17th, and following days.

The supplemental examinations in all other subjects will be held on October 6th, and following days.

The examinations in English Literature (Vacation Work, see p. 154), and the Exhibition Examinations will be held on Saturday, October 6th, and following days.

Field Work in Surveying will commence on Saturday, September 1st.

Lectures in the First Year will commence on Tuesday, September 25th.

Lectures in the Second, Third and Fourth Years, Electrical, Mechanical, and Practical Chemistry Courses, will commence on Tuesday, September 25th.

Lectures in the Second, Third and Fourth Years, Architectural, Civil and Mining Courses, will commence on Monday, October 1st.

Macdonald Engineering Building.

Faculty of Applied Science

§ I. GENERAL STATEMENT.

The Instruction in this Faculty is designed to afford a complete preliminary training, of a practical as well as theoretical nature in the following Departments:—

I.—Architecture.
II.—Civil Engineering and Surveying.
III.—Electrical Engineering.
IV.—Mechanical Engineering.
V.—Mining Engineering and Metallurgy.
VI.—Practical Chemistry.

The Degrees conferred by the University upon such undergraduates of the Faculty as fulfil the conditions and pass the Examinations hereinafter stated are, in the first instance, "Bachelor of Science" (B.Sc.), mention being made in the Diploma of the particular Department of study pursued, and, subsequently, the Degrees of "Master of Science" (M.Sc.), and "Doctor of Science" (D.Sc.).

§ II. MATRICULATION AND ADMISSION.

For subjects of matriculation, conditions and fees, see pp. 9-17.

§ III. EXAMINATIONS AND DEGREES.

1. Faculty Examinations.

There will be a Christmas examination in such subjects as shall be determined by the Faculty. Sessional examinations will be held at the end of the First and Second Years.

2. University Examinations

I. FOR THE DEGREE OF BACHELOR OF SCIENCE.

(*a*) There will be a Primary examination at the end of the Third Year. Candidates must pass this Examination before entering the Final Year.

(*b*) There will be a Final examination for the degree of Bachelor of Science at the end of the Fourth Year.

Successful Students will be arranged in order of merit.

II. HIGHER DEGREES.

For regulations relating to the Degrees of "Master of Science" (M.Sc.), and "Doctor of Science" (D.Sc.), see pp. 22, 23.

III. SPECIAL PROVISIONS FOR OBTAINING THE TWO DEGREES OF "BACHELOR OF ARTS" (B.A.), AND BACHELOR OF SCIENCE (B.SC.), IN SIX YEARS.

1. Undergraduates of the Faculty of Arts, who have taken all the Ordinary Mathematics of the first two years, and the Chemistry of the Second Year, and who wish to pursue their professional studies in the Faculty of Applied Science so as to obtain the degrees of B.A. and B.Sc. within the following four years, may be exempted by the Faculty of Applied Science from the Mathematics of the First Year in Applied Science and the Chemistry of the Second Year.

2. They are allowed to distribute the course of the Third and Fourth Years in Arts over three years.

3. They may complete the Arts curriculum by taking the following courses:

I. *In the Third Year:*

(*a*) Physics of Third Year.

(*b*) Either one or two of the courses which are not placed under the heading "Science" in the Arts curriculum.

(*c*) Either one or two hours weekly in English Composition.

II. *In the Fourth Year:*

(*a*) The Mathematics of the Second Year Applied Science (6 hours weekly as 1½ courses).
(*b*) Physics of Fourth Year.
(*c*) One of the courses which are not placed under the heading "Science" if only one has been taken in the Third Year.
(*d*) One hour weekly in English Composition if only one has been taken in the Third Year.

III. *In the Fifth Year:*

The Mathematics of the Third Year Applied Science (2 hours weekly as a half course), or another course under the heading "Science" in Arts curriculum.

The degree of B.A. may thus be obtained at the end of the Fifth Year from Matriculation.

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§ IV. GRADUATE COURSES.

Students who take the Bachelor's degree in one of the courses provided by the Faculty of Applied Science may graduate in any of the remaining courses by attending one or more subsequent sessions.

Graduates may also take an advanced course in the branch in which they have received their degree. On passing an examination at the end of such advanced course, the Master's degree will be conferred without further examination, on presentation at the end of one additional year of a satisfactory thesis on approved work.

Students are strongly recommended to take a Graduate Course, and special arrangements will be made for advanced and research work in the following:—

In Architecture—Advanced study in design. During Ses-

sion 1899-1900, the problems studied were the following, finished drawings being made of the designs:—"A Students' Hall;" "A Gothic Memorial Church;" "A Public Library;" "An Open House." In addition, Sketch Problems (limited to time) were set as follows:—"An Entrance Gateway to a Naval Yard;" "A Fountain in a Park."

In Chemistry and Mineralogy. (See § XI, 2, 9 and 13, and § XII, 4.)

In the determination and comparison of the errors and the co-efficients of standards of length. (See § XI, 4, and § XII, 6.)

In the determination of gravity. (See § XII, 6.)

The elasticity and strength of materials. (See § XI, 3, and § XII, 13.)

In Mining and Metallurgy—Advanced study in metalurgy and ore dressing can be carried on with great advantage in the new laboratories. (See § XI, 13, and XII, 10.)

The efficiency of pumps and hydraulic motors. (See § XI, 3, and XII, 7.)

The efficiency or power transmission by air, water, gas, steam and electricity. (See § XI, 3, 5, 11.)

The efficiency of steam, gas and hot-air engines and of air compressors. (See § XI, 11 and 15.)

The efficiency of machines and machine tools, and the power absorbed by the several processes of mechanical work. (See § XI, 11.)

The efficiency of dynamometers, belting and shafting, including investigations into the relative merits of the several unguents. (See § XII, 9.)

The efficiency of the several types of boilers, including investigations on the heat producing power of fuels. (See § XI, 15.)

On the efficiency of dynamos and electric motors. (See § XI, 5, and § XII, 5.)

The flow of water through orifices and pipes, and over weirs. (See § XI, 3, and § XII, 7.)

In Geodesy and practical astronomy. (See § XII, 6.)

In street railway design and theory, and in alternating apparatus. (See § XI, 5, and § XII, 5.)

In Physics.—The Macdonald Physics Building has been equipped and arranged with special reference to Graduate Courses and original research work in various branches of pure Physics. Every facility will be afforded in the workshops for the construction of special apparatus required for such investigations. (See § XII, 12.)

In Mathematics.—Students taking Graduate Courses will receive guidance in any advanced Mathematics required in connecion with their work.

§ V. ATTENDANCE AND CONDUCT.

See p. 25.

§ VI. LIBRARY.

Students in this Faculty are entitled to use the University Library under the regulations cited on p. 32. Students also have access to the various departmental libraries under the special regulations by which each is governed.

§ VII. FEES AND REGISTRATION.

All fees and fines are payable to the Bursar.

The fees must be paid to the Bursar and the tickets of admission to classes shown to the Dean within a fortnight after the commencement of attendance in each session. In case of default, the student's name will be removed from the College books, and can be replaced thereon only by permission of the Faculty, and on payment of a fine of $2.

Annual fee for the undergraduate course..	$156.00
The fees for Partial Students are:—$10.00 for Library, Athletics and Caution money; and a fee at the rate of $5.00 for each hour of instruction per week, extending throughout the session..	
Deposit for caution money for undergraduates and conditioned students..	5.00

Fee for ordinary supplemental examination	2.00
Fee for special supplemental examination	5.00
Fee for certificate of standing	2.00
Fee for Graduate Course	150.00

Graduates of this Faculty will be required to pay only one-half of this amount.

§ VIII. MEDALS, EXHIBITIONS, PRIZES AND HONOURS

1. The British Association Medals and Exhibition, founded by the British Association for the Advancement of Science, in commemoration of the meeting held in Montreal in the year 1884.

A British Association Medal and Prize in Books are open for competition to students of the Graduating Class in each of the six Departments of the Faculty, and, if the examiners so recommend, will be awarded to the student taking the highest position in the final examinations.

2. The Governor General's Silver Medal (the gift of His Excellency The Right Honourable the Earl of Minto).

This medal will be awarded for graduate Research Work.

3. Summer Work. (See § IX, 1.) The following prizes are offered for the best summer Theses:—

To the students of the Civil Engineering Course a prize of $25 presented by E. B. Greenshields, Esq., B.A.

To the students of the Electrical Engineering Course, a prize of $25 presented by Robert Gardner, Esq.

To the students of the Mechanical Engineering Course, a prize of $25 presented by The Crosby Steam Gage & Valve Co.

To the students of the Mining Engineering Course, a prize of $25.

To the students of the Architectural Course, a prize of $25 presented by A. T. Taylor, Esq., F.R.I.B.A., R.C:A:, Past President of Quebec Architects' Association.

Two prizes of $35 and $15 offered by the General Mining Association of the Province of Quebec will be open for competition to students from McGill University, Toronto

University and Queen's University, and will be awarded to the two students presenting the best Summer Theses on some subject connected with mining. Preference will be given to those Theses which show decided originality.

The following Exhibitions and Prizes will be open for competition at the beginning of the Session. *Students are required to notify the Dean of their intention to compete, at least one week before the commencement of the Examination.*

4. A British Association Exhibition of $50.00 and prize of $25.00 to students entering the Fourth Year, the subjects of examination being the Mathematics and Theory of Structures of the Ordinary Course.

5. Three prizes of $25.00, $15.00 and $10.00, to students entering the Third Year, the subject of Examination being:—the Mathematics of the Second Year Course.

6. A Scott Exhibition of $50.00, founded by the Caledonian Society of Montreal, in commemoration of the Centenary of Sir Walter Scott, and two prizes of $25.00 and $15.00 to students entering the Second Year, the subjects of Examination being:—

(*a*) English Literature (Summer Vacation Work); (*b*) Mathematics of the First Year Course; (*c*) Descriptive Geometry of the First Year Course.

7. Two prizes, each of $10.00, presented by J. M. McCarthy, Esq., B.A.Sc., to students entering the Third Year, for proficiency in Levelling or Transit Work.

8. The sum of $150, presented by W. A. Carlyle, Esq., Ma.E., may be awarded in prizes to students of the Mining Course taking the highest positions in the degree examinations of 1901.

9. A prize of $25.00, presented by Messrs. Fraser and Chalmers, may be awarded in the graduating class for the best piece of Mining Laboratory work.

10. A prize of $50.00, presented by James Tighe, B.A.Sc., for research work in Hydraulics.

11. A scholarship of the value of $100, for proficiency in Practical Chemistry, on the endowment of the late Dr. T.

Sterry Hunt, to students entering the Second Year of the Chemical Course. For further conditions apply to the Dean.

12. The Canadian General Electric Company, through Mr. F. Nicholls, of Toronto, has decided to present annually to the Faculty two scholarships, each in the form of a three months' course at the Company's works at Peterboro, with the addition of a sum of $100.00.

13. Prizes or Certificates of Merit are given to such students as take the highest place in the Sessional and Degree Examinations.

14. HONOURS.—On graduation, Honours will be awarded for advanced work in Professional subjects.

15. SCIENCE SCHOLARSHIPS GRANTED BY HER MAJESTY'S COMMISSION FOR THE EXHIBITION OF 1851.—The Scholarships of £150 sterling a year in value are tenable for two or, in rare instances, three years. They are limited, according to the Report of the Commission, "to those branches of Science such as Physics, Mechanics and Chemistry, the extension of which is specially important for our national industries." Their object is, not to facilitate ordinary collegiate studies, but "to enable students to continue the prosecution of Science with the view of aiding in its advance or in its application to the industries of the country."

A nomination to one of these scholarships for the year 1899 was placed by the Commission at the disposal of McGill University, and another may be granted in 1901.

It is open to students of not less than three years' standing in the Faculties of Arts or Applied Science, and is tenable at any University or at any other Institution approved by the Commission.

16. The Mason prize of $50.00 in Electrical Engineering, given by Dr. A. F. Mason for original investigation in the practical application of Electricity.

17. WORKSHOP PRIZES.—A prize of $20.00, presented by C. J. Fleet, B.A., B.C.L., for bench and lathe work in the woodworking department, open to students of not more than two terms' standing in workshop practice.

§ IX. SPECIAL PROVISIONS.

1. SUMMER WORK.—During the summer vacation following the close of each year, all students entering the Third and Fourth Years are required to prepare a thesis on a subject specified by the Faculty. Any student may substitute for the specified subject a report on some practical work in course of construction. The marks given for these theses will be added to the results of the sessional examinations. The theses must be handed in to the Dean on or before September 26th.

2. All Students in the Architectural, Civil, and Mining Engineering Courses, entering the Second and Third Years, and Students in the Civil Engineering Course entering the Fourth Year, are required to be in attendance at the University on the 1st September, when the Field-work in Surveying will commence. (See § XI., 14.)

3. All Students in the Mining Course are required to attend the Summer School in Mining, held between the Third and Fourth Years (four to six weeks of field-work), and students between the Second and Third Years are advised to do the same if practicable. The school is held in May and June.

4. Partial Students may be admitted to the professional classes upon payment of special fees. (§ VII.)

5. Students in Applied Science may, by permission of the Faculty, take the Honour Classes in the Faculty of Arts.

6. Undergraduates in Arts of the Second and Third Years, or Graduates of any University, entering the Faculty of Applied Science, may, at the discretion of the Professors, be exempted from such lectures in that Faculty as they have previously attended as Students in Arts.

7. Students who have failed in a subject in the Christmas or Sessional Examinations may regain their standing by passing a supplemental examination at a time appointed by the Faculty. Unless such supplemental examination is passed, Students will not be allowed to proceed to any subsequent examination in the subject. A second supplemental examination will not be granted unless under exceptional circumstances, to be investigated in each case by the Faculty.

8. Students may be required to answer satisfactorily a weekly paper on such subjects of the course as the Faculty may determine.

9. Credit will be given in the Sessional Examinations for work done during the session in certain of the subjects which will be specified at the commencement of the first term.

10. Students who fail to obtain their Session, and who in consequence repeat a Year, will not be exempted from examination in any of those subjects in which they may have previously passed, except by the express permission of the Faculty. Application for such exemption must be made at the commencement of the Session.

11. Partial Students are not eligible for prizes.

12. Certificates may be given to Students who have passed through any of the special courses attached to the curriculum.

13. The headquarters of the Canadian Society of Civil Engineers are located in Montreal. The Society holds fortnightly meetings, at which papers upon practical current engineering subjects are read and discussed. Undergraduates joining the Society as Students may take part in these meetings, and acquire knowledge of the utmost importance in relation to the practical part of the profession.

X. DEPARTMENTS.

I. ARCHITECTURE.

The Architectural Course begins in the second year, for which the first year is preparatory especially in the departments of Mathematics and Drawing (Freehand, Lettering and Projections).

The work of the second year is of a general character, and is planned to combine to some extent the work of the Architectural and of the Civil Engineering students.

The third and fourth years are devoted to more specialized architectural study in various branches, and a fifth or graduate year has been organized for advanced study in design. For those students who desire to devote themselves more especially to the engineering side of architecture, the course is modified to include additional Mathe-

A Room in the Architectural Department

matics in the third year, and the advanced course of Theory of Structures in the fourth year. Such students devote proportionately less time to architectural drawing and designing.

In the second year the Historical Course embraces a rapid survey of Architectural History from ancient Egyptian to modern times. The great eras of European civilization are successively dealt with, and the evolution of styles is traced in their constructional and ornamental forms and methods.

In the third and fourth years the lectures are arranged in continuation and extension of this general course. Renaissance and Modern Architecture are studied in the third year; while a course covering both third and fourth years comprises more detailed study of Ecclesiastical, Domestic and Public Architecture, and deals with the historic evolution of architectural styles and with the problems and requirements of modern work.

The constructive side of architecture is dealt with in the Architectural Engineering Courses.

In the second year a general course, common to architectural and engineering students, is given upon Building Construction and Materials, which is supplemented and continued in the Testing Laboratories, where practical experiments are conducted.

The Theory of Structures is dealt with, as also Sanitation and Hygiene, Heating and Ventilation, and Electric Installation. Specifications, including Working Drawings and Architectural Practice, are included in the fourth year.

For the scientific requirements of the profession the courses in Mathematics are very fully developed, and include Descriptive Geometry, Shades and Shadows and Perspective; Surveying is also studied.

Instruction in Drawing is given during all four years—Freehand Drawing (ornament and figure) from the cast, and Architectural Drawing occupying much of the students' time during three years of the course. Modelling in clay is included in the third and fourth years.

Problems in Architectural Design form the basis of work in the Architectural Drawing class from the earliest available period, being at first more especially combined with the study of the Classified Orders.

A course of lectures is included upon General Art History, so as to place the architectural student in touch, not only with the decorative details of the different architectural styles, but also with contemporary forms in other branches of art, especially the decorative arts employed in building.

The subjects of instruction and the number of hours per week devoted to each subject are as follows:—

FIRST YEAR.

Descriptive Geometry.. 7
English.. 2
Freehand Drawing.. 3
Lettering.. 3
Mathematics.. 10
Mathematical Lab.. .. ..3 (a)
Physics.. 2
Physical Laboratory.. 3
Shopwork.. 7

SECOND YEAR.

Architectural Engineering... ..
Architecture (Elements of).. ..1
Architecture (History).. 2
Building Construction.. 1
Chemistry.. 3
Descriptive Geometry.. 3
Drawing and Design.. 7
Freehand Drawing.. 4
Mathematics.. 6
Physics.. 2
Chemical Lab.. 3
Physical Lab.. 3
Shopwork.. 3

THIRD YEAR.

Architectural Engineering... ..
Architecture.. 1
Architecture (History).. 2
Art History.. 1
Descriptive Geometry.. .. .. ..3 (a)
Designing or Drawing 13 (a), 10 (b)
Freehand Drawing..7 (a), 5 (b)
Graphical Statics.. .. .. ..2 (a)
Hygiene.. .. ..1 (b)
Mapping.. .. .. 3 (a)
Mathematics.. .. .. ..3 (opt.)
Modelling.. .. ..3 (b)
Municipal Engineering 1 (opt.)
Surveying.. 3
Theory of Structures.. 3
Testing Laboratory.. .. ..3 (b)

FOURTH YEAR.

Architectural Engineering... ..
Architecture.. 1
Art History.. 1
Designing.. 20
Freehand Drawing and Water Colouring.. .. ..6 (a), 6 (b)
Geology.. .. ..3 (a)
Graphical Statics.. .. ..3 (opt.)
Hygiene.. .. ..1 (b)
Physics.. .. .. 2 (a), 1 (b)
Modelling.. .. ..3 (b)
Municipal Engineering 1 (opt.)
Specifications.. 1
Theory of Structures.. ..4 (opt.)
Testing Laboratory.. ..4 (opt.)

II. CIVIL ENGINEERING.

The courses of study in this Department are designed to give to the student a sound theoretical and practical training in the

sciences and principles which underlie the profession of a civil engineer. It is scarcely possible for any one person to become proficient in all branches of civil engineering, so wide in its scope and so inclusive in its purpose. As generally defined it is the "art of economically directing the great sources of power in nature to the use and convenience of man," by the construction of roads, railways, bridges, aqueducts, viaducts, canals, docks, harbours, breakwaters, lighthouses, by the construction and adaptation of machinery, by the lighting and drainage of cities and towns, and by the exploitation of mines. All these works are more or less governed by the same principles, and in these principles the student is carefully instructed, and by means of numerous problems occuring in every day practice, he is taught to apply his knowledge to the actual conditions of life.

During session 1900-01 arrangements have been made for the delivery, by distinguished engineers, of special lectures or short courses of lectures on actual works of construction.

Provision is made, by means of advanced classes, for graduates and special students to continue their studies and to engage in researches with a view to the solving of some of the numberless problems which confront the engineer in every direction. Much valuable work of this character has been already accomplished, and especial reference may be made to the fact that for several years graduates of other Universities—some holding scholarships under the Royal Commissioners for the Exhibition of 1851—have carried out investigations in the several laboratories.

The subjects of instruction and the number of hours per week devoted each subject are as follows:—

First Year.

Descriptive Geometry.. 7	Physics.. 2
English.. 2	Mathematical Lab.. .. ..3 (a)
Freehand Drawing.. 3	Physical Laboratory.. 3
Lettering.. 3	Shopwork.. 7
Mathematics.. 10	

Second Year.

Building Construction.. 1	Physics.. 2
Chemistry.. 3	Structural Engineering.. .. ..
Descriptive Geometry.. 3	Surveying.. 3
Descriptive Mechanism.. 1	Chemical Laboratory.. 3
Mapping.. 6	Physical Laboratory.. 3
Mathematics.. 6	Shopwork.. 4

THIRD YEAR.

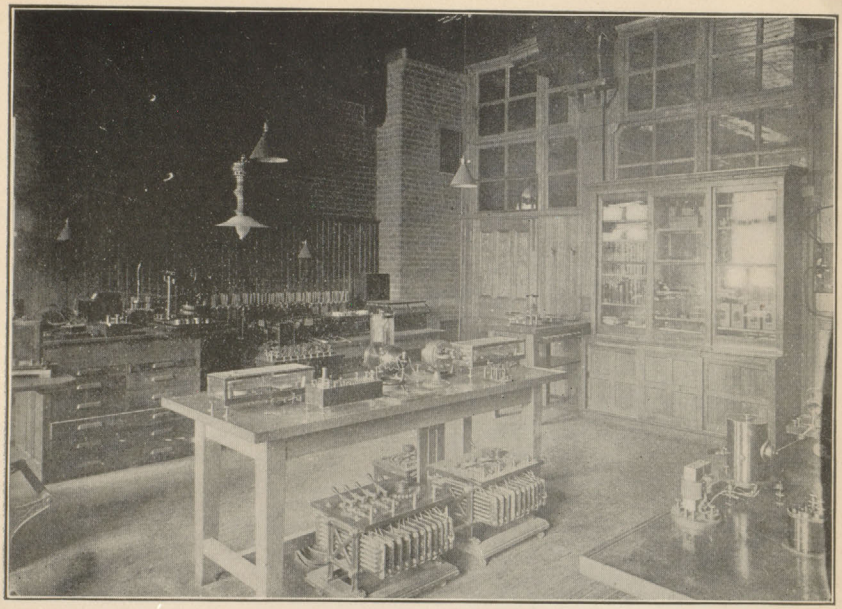
Descriptive Geometry.. 4
Geology.. 3
Graphical Statics.. .. ..2 (a) 3 (b)
Mapping.. 6
Mathematics.. 2
Mechanical Drawing.. .. 3 (opt.)
Municipal Engineering.. 1
Museum Work in Geology..1 (b)
Physics.. .. ..2 (a), 1 (b)
Railway Structures.. .. ..3 (b)
Roads and Canals.. 2
Structural Engineering.. .. ..
Surveying.. 2
Theory of Structures.. 3
Thermodynamics.. 1
Physical Laboratory.. ..3 (a)
Testing Laboratory.. .. ..3 (b)
Thermodynamic Lab.. ..2 (b)

FOURTH YEAR.

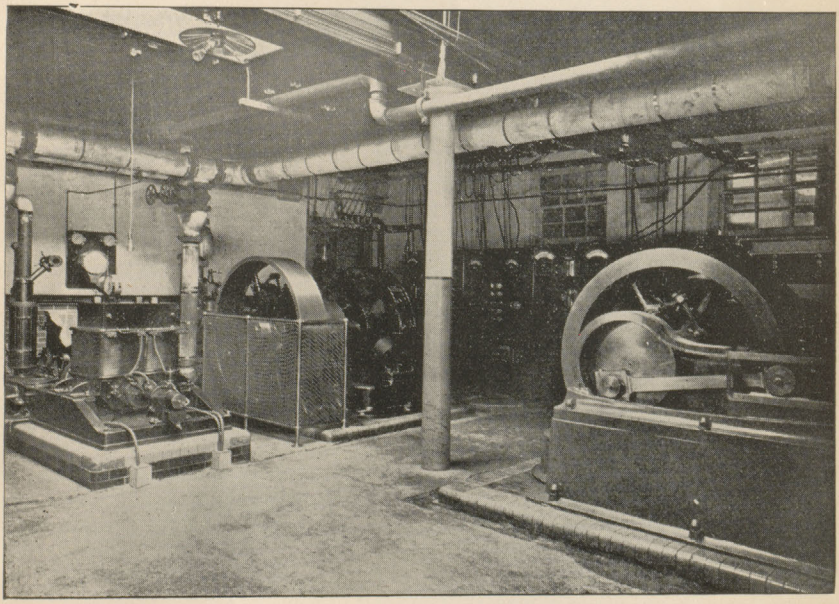
Designing.. 6
Geodesy.. 2
Graphical Statics.. 3
Hydraulics.. 2
Mechanical Engineering.. ..2 (a)
Municipal Engineering.. 1
Prime Movers.. 1
Railway Engineering.. 2
Structural Engineering... ...
Theory of Structures.. 4
Geodetic Laboratory.. 4
Hydraulic Laboratory.. ..3 (b)
Testing Laboratory.. 6

III. ELECTRICAL ENGINEERING.

The first two years of the Undergraduate course of instruction in Electrical Engineering are devoted mainly to preparation in mathematics, physics, chemistry, mechanics, drawing and shopwork and work in the physical and chemical laboratories. The electrical studies of the Third Year consist of the principles of electro-magnetism and continuous current dynamo electric machinery—two lectures per week, the principles of electrical measurement—one lecture per week, and four periods of three hours each in the Physical and Electrical Engineering laboratories. The Fourth Year is devoted principally to electrical work. Lectures and recitations on alternating current phenomena, including the principles of action and design of alternating current machinery for lighting and power purposes—three lectures per week; electric lighting systems, including central station design and operation, street railways, electric power transmission, etc.,—three lectures per week; and three periods of three hours each in the electrical engineering laboratory. In the second term of the Fourth Year a choice may be made between the following options: electro-chemistry, advanced thermodynamics, hydraulics (second term). Each Fourth Year student is required to present a thesis giving the results of a suitable experimental investigation.



Electrical Engineering Laboratory.



Lighting Station.

The subjects of instruction and the number of hours per week devoted to each subject are as follows:—

FIRST YEAR.

Descriptive Geometry.. 7
English.. 2
Freehand Drawing.. 3
Lettering.. 3
Mathematics.. 10
Physics.. 2
Mathematical Laboratory 3 (a)
Physical Laboratory... 3
Shopwork.. 7

SECOND YEAR.

Chemistry.. 3
Descriptive Geometry.. 3
Kinematics of Machines.. 3
Mathematics.. 6
Mechanical Drawing.. 3
Physics.. 3
Chemical Laboratory.. 3
Physical Laboratory.. 3
Shopwork.. 6

THIRD YEAR.

Chemistry.. 1
Direct Current Dynamo Machinery.. 2
Dynamics of Machines 2
Machine Design.. 1
Mathematics.. 3
Mechanical Drawing.. 3
Physics.. .. .. 2 (a) 1 (b)
Theory of Strtctures.. 3
Thermodynamics... 2
Chemical Laboratory.. 3
Electrical Engineering Laboratory.. 6
Physical Laboratory.. 6
Testing Laboratory.. .. ..3 (b)
Thermodynamic Lab.. ..3 (b)

FOURTH YEAR.

Alternating currents and Alternating current machinery..3
Dynamics of Machines.. 2
Electro-Chemistry.. .. .. ..1 (b)
Electrical Designing.. 4
Electric Lighting.. .. .. ..3 (a)
Electric Railways.. .. .. ..3 (b)
Electrical Measurements.. ..
Hydraulics.. 2
Machine Design .. .. ..1 (a)
Mechanical Engineering ..2 (a)
Thermodynamics.. 2
Electro-Chemical Lab.. ..3 (b)
Electrical Engineering Lab.. 9
Hydraulic Laboratory.. ..3 (b)

IV. MECHANICAL ENGINEERING.

The complete Undergraduate course in Mechanical Engineering extends over four years, and provision is made for a fifth year or Graduate course in advanced experimental and other work.

The first two years of the Undergraduate course of instruction are largely devoted to preparation in mathematics, physics, chemistry,

mechanics, drawing, and shopwork. During the second year an elementary series of lectures on Descriptive Mechanism serves to introduce the subject of machine construction and machinery in general, and one lecture and one exercise class per week are devoted to the Kinematics of Machines.

While motion without regard to force is treated in the Kinematic course, the action of external forces in producing or changing motion in the links of mechanisms is considered in the third and fourth years, under the head of Dynamics of Machines. Two lectures per week are given in this subject in each year, and exercise classes are held for the purpose of working the problems necessary for illustration.

The work in Machine Design is carried on during the third and fourth years in conjunction with the practical instruction in mechanical drawing and designing in the Drawing Rooms.

A course of two lectures per week is given, during the Fourth Year, on Mechanical Engineering as applied to questions connected with Power Installations and Prime Movers. A large portion of the work of this course is supplementary to, and follows, the instruction given in Thermodynamics, which extends over the Third and Fourth Years. (See page 169.)

Instruction in Workshop Practice (see page 191) is given in each of the four years. It is of a systematic nature, and is intended to prepare for, but by no means to replace, that practical experience of workshop operations on a commercial basis which every mechanical engineer must obtain for himself.

The work of the Lecture Rooms is illustrated throughout the course by experimental work carried out by the student, and by demonstrations in the laboratories of the department.

The subjects of instruction and the number of hours per week, devoted to each subject are as follows:—

FIRST YEAR.

Descriptive Geometry	7	Physics	2
English	2	Mathematical Laboratory	3 (a)
Freehand Drawing	3	Physical Laboratory	3
Lettering	3	Shopwork	7
Mathematics	10		

SECOND YEAR.

Chemistry	3	Mechanical Drawing	6
Descriptive Geometry	3	Physics	2
Descriptive Mechanism	1	Chemical Laboratory	1
Kinematics of Machines	3	Physical Laboratory	3
Mathematics	6	Shopwork	7

THIRD YEAR.

Dynamics of Machines.. 2	Theory of Structures.. 3
Graphical Statics.. .. .. ..2 (a)	Thermodynamics... 1
Machine Design.. 2	Dynamo Laboratory.. ..3 (a)
Mathematics.. 2	Physical Laboratory... 3
Mechanical Drawing.. 6	Testing Laboratory.. ..3 (b)
Metallurgy.. .. ..1 (a)	Thermodynamic Lab.. ..3 (b)
Physics.. 2	Shopwork.. 6

FOURTH YEAR.

Designing..	Mechanical Engineering ..2 (a)
Dynamics of Machines.. 2	Thermodynamics.. 2
" " (exercises).. 2	Hydraulic Laboratory.. ..3 (b)
Hydraulic and Hyd. Machinery. 2	Metallurgical Laboratory..3 (d)
Machine Design.. 21	Testing Laboratory.. .. ..3 (c)
Machine Design (exercises).... 1	Thermodynamic Laboratory 12
Metallurgy.. 1	Shopwork.. 4

V. MINING AND METALLURGY.

I. The first two years of the Undergraduate course in Mining and Metallurgical Engineering are mainly devoted to Mathematics, Mechanics, Physics, Elementary Chemistry, etc., as it is deemed desirable that the Students should master the general principles underlying all scientific work before they attack the somewhat complex and specialized subjects of the professional course.

In the third year the department gives Elementary courses in both Mining and Metallurgy, and a thorough course in fire assaying, but again the chief work of the year is in Applied Mechanics, Elementary Mechanical Engineering, Geology, Mineralogy and Chemistry.

The fourth year on the other hand is very largely given up to special work in Mining and Metallurgy, and, in addition to the lectures and demonstrations, nearly two days per week are spent in the departmental laboratories and drawing room.

The subjects of instruction and the number of hours per week devoted to each subject are as follows:—

FIRST YEAR.

Descriptive Geometry.. 7	Physics.. 2
English.. 2	Mathematical Laboratory..3 (a)
Freehand Drawing.. 3	Physical Laboratory... 3
Lettering.. 3	Shopwork.. 7
Mathematics.. 10	

SECOND YEAR.

Chemistry.. 3
Descriptive Geometry.. 3
Descriptive Mechanism.. 1
Mapping.. 3
Mathematics.. 6
Physics.. 2
Surveying.. 3
Chemical Laboratory.. 6
Physical Laboratory.. 3
Shopwork.. 4

THIRD YEAR.

Geological Excursions .. ..4 (c)
Geological Museum Work..1 (b)
Geology.. 3
Graphical Statics.. .. .. ..2 (a)
Machine Design.. 2
Mapping.. .. .. ..3 (a), 2 (b)
Mathematics.. 4
Mechanical Drawing.. 3
Metallurgy.. 1
Mineralogy.. 2
Ore-Dressing.. 1
Physics (1900-01 only) 2 (a) 1 (b)
Surveying.. 3
Theory of Structures.. 3
Thermodynamics.. 1
Chemical Laboratory.. 3
Determinative Mineralogy Laboratory.. 3
Fire Assaying Laboratory.4 (b)
Ore-dressing Lab.. .. ..2 (a)
Physical Laboratory .. ..3 (a)
Testing Laboratory .. ..3 (b)
Thermodynamics Lab.. ..2 (b)

FOURTH YEAR.

Chemistry.. .. .. 2 (b) opt.
Designing and Project.. 3
Geology and Ore Deposits 1 (a), 2 (b)
Geological Colloquium.. ..1 (b)
Hydraulics.. ..2 (a), 2 (b) opt.
Metallurgy .. .. ..3, 2 (b) opt
Mineralogy.. .. ..2 (a)
Mining.. 2
Mining Machinery.. ..2 (a), 1 (b)
Mining Colloquium.. 1
Palaeontology.. .. ..2 (b) opt.
Petrography.. .. ..1 (a)
Mechanical Engineering..2 (a)
Transportation.. 1
Assay Laboratory (1900)..4 (b)
Chemical Laboratory.. 6
Hydraulic Laboratory 3 (b) opt.
Metallurgical Lab. 7 (a), 5 (b)
Ore-dressing Lab. 5 (a), 6 (b)
Petrographical Laboratory.3 (b)

VI. PRACTICAL CHEMISTRY.

The course in Practical Chemistry is arranged to give the student in the first two years a thorough knowledge of the fundamental principles of Chemistry and Physics, with sufficient Mathematics to enable him to understand the theoretical parts of these subjects.

In the two subsequent years Chemistry, analytical, organic and physical, is taught both in its purely scientific aspects and in its relation

to all kinds of commercial work. Special facilities are afforded for the prosecution of post-graduate research work in all the branches of Chemistry.

The subjects of instruction and the number of hours per week, devoted to each subject are as follows:—

FIRST YEAR.

Descriptive Geometry.. 7
English.. 2
Freehand Drawing.. 3
Lettering.. 3
Mathematics.. 10
Physics.. 2
Mathematical Laboratory..3 (a)
Physical Laboratory... 3
Shopwork.. 7

SECOND YEAR.

Chemistry.. 3
Mathematics.. 6
Physics.. 2
Chemical Laboratory.. 17
Physical Laboratory.. 3

THIRD YEAR.

Chemistry.. 3
Determinative Mineralogy .. ..
Geology.. 3
Metallurgy.. 1
Mineralogy.. 2
Ore-dressing.. 1
Physics.. 0
Chemical Laboratory.. 18
Physical Laboratory.. .. 3 (a)

FOURTH YEAR.

Chemistry.. 4
Mineralogy.. .. ..2 (a)
Chemical Laboratory.. 29

§ XI. COURSES OF LECTURES.

N.B.—The following courses are subject to such modifications during the year as the Faculty may deem advisable.

1. ARCHITECTURE.

Professor:—S. HENBEST CAPPER, M.A. (Macdonald Professor of Architecture.)
Lecturer:—H. F. ARMSTRONG.

The courses of study are as follows:—

1. General Architectural History. Second Year. (First Term), Ancient Egypt; Greece; Rome; Byzantine and Early Christian Architecture. (Second Term), Romanesque; the Monastic Orders; Gothic; Renaissance. Tues., 12; Thurs., 11. Mr. Capper.

Text Books:—

Smith & Slater: "Architecture, Classic & Early Christian;" Smith & Poynter: "Architecture, Gothic & Renaissance;" (S. Low, Marston & Co.); or Hamlin: "History of Architecture" (Longmans, Green & Co.).

Reference Books:—

Ferguson: "History of Architecture" (Murray). R. Sturgis: "European Architecture." (Macmillan). Moore: "Gothic Architecture." (Macmillan).

2. Renaissance and Modern Architecture. Third Year. (First Term) Italy; Spain. (Second Term) France; England; Colonial; Modern. Wed., 12; Thurs., 9. Mr. Capper.

Text Book:—

Anderson: "Renaissance Architecture in Italy" (Batsford.)

Reference Books:—

Fergusson: "History of Modern Architecture" (Murray). Blomfield: "Renaissance Architecture in England." (Bell).

3. Domestic, Public and Ecclesiastical Architecture. Fourth Year. Historical Survey; modern conditions and requirements. Fri., 9. Mr. Capper.

Reference Books:—

Statham: "Modern Architecture" (Chapman & Hall). Stevenson: "House Architecture" (Macmillan).

4. Elements of Architecture. Second Year. The classical Orders; arcading, mouldings, etc., classical and gothic; composition; elements of architectural effect; style. Wed., 11. Mr. Capper.

Reference Books:—

Baldwin Brown: "The Fine Arts" (Murray; Scribner). Statham: "Architecture for General Readers" (Chapman & Hall).

5. Art History. Third and Fourth Years together. Sculpture; painting; the industrial arts. Tues., 9. Mr. Capper.

Reference Books:—

Baldwin Brown: "The Fine Arts" (Murray; Scribner). Upcott: "Introduction to Greek Sculpture," (Clarendon Press), Gardner: "Handbook of Greek Sculpture." (Macmillan).

6. Drawing and Modelling.

(*a*) Freehand Drawing from the cast (ornament and figure). Second Year, 4 hrs.; Third and Fourth Years, 6 hrs.; extra time for Water Colour work. Mr. Armstrong.

(*b*) Architectural Drawing and Design.—Mr. Capper. Second Year, 7 hrs. Studies of the orders; rendering with pen and brush. Order problems:—(Session 1899-1900): "A Pavilion in a Park;" "A Museum Staircase."

Third Year (First term), 13 hrs.; (Second term), 10 hrs. Problems in design:—(Session 1899-1900): "A Loggia upon a Roman Doric Arcade;" "The Staircase of a Public Library;" "A Boat House and Landing Stage;" "A provincial Museum;" "A Billiard Room." Sketch Problem (limited in time): "A Covered Bridge in a Private Park."

Fourth Year, 20 hrs.; Problems in design:—(Session 1898-1899): "A City Club House;" "A Cottage Hospital;" "A College Chapel; "A Small Public Hall." Sketch Problems (limited in time): "A Stone Bridge;" "A Covered Portico and Well."

Advanced (Graduate) Course. Problems in design:—(Session 1899-1900): "A Student's Hall;" "A Gothic Memorial Church;" "A Public Library;" "An Opera House." Sketch Problems: "An Entrance Gateway to a Naval Yard;" "A Fountain in a Park."

(*c*) Modelling. Third and Fourth Years, 3 hrs. (second term). Architectural ornament modelled in clay from the cast. Mr. Armstrong.

7. Building Construction. Second Year. Lectures and exercises, (see page 151), Tues., 12. Mr. Capper and Mr. Lea.

Text Books:—

Burrell: "Elementary Building Construction" (Longmans); "Advanced Building Construction" (Longmans).

Reference Books:—

Kidder: "Building Construction and Superintendence" (Comstock); "Notes on Building Construction" (Rivington's Series); (Longmans, Green & Co.). Mitchell: "Building Construction Plates" (Cassell).

8. Specifications and Contracts. Third and Fourth Years together. General Conditions of contract; specifications for various trades; professional practice. Mon., 9. Mr. Capper.

Reference Books:—

Bower: "Specifications" (Comstock). "Specification" (London).

9. Hygiene. Third and Fourth Years together. Principles of Sanitation and House drainage; ventilation; heating; electric installation. (Second term), Fri., 12. Mr. Capper.

Architectural Engineering.

During the session 1900-1901, Messrs. E. E. S. Mattice, B.A.Sc. (McGill), and M. C. J. Beullac, B.Sc. (Univ. of France), of the Dominion Bridge Works, will give special courses of lectures in the following:—

1. Building materials; the history, properties, tests and uses of all materials of construction.
2. Specifications and professional practice; the different methods of preparing specifications for estimates, instructions to bidders, and rules to be observed in writing specifications, general clauses, law of contracts.
3. Building Construction:
   (*a*) Carpentry; frames, joints, framing of floors and roofs, partitions, bridging, furring, etc.
   (*b*) Slow burning construction.
   (*c*) Masonry.
4. Hygiene:
   (*a*) Plumbing.
   (*b*) Disposal of household refuse.
   (*c*) Heating.
   (*d*) Ventilation.
5. Steel frame buildings; design, mill-work, steel and cast iron columns and connections, beams and girders, framing and wind bracing.

Special designs will be prepared in the drawing-room illustrating the several subjects of the lectures.

ARCHITECTURAL EQUIPMENT.

The architectural equipment consists of a representative collection of casts of architectural detail and ornament and sculpture; of photographs and illustrations; an arc-light electric lantern; a large collection of slides, diagrams and models; and a library for architectural study. (See § XIII.)

WOMEN STUDENTS.

The Architectural, Freehand Drawing and Modelling Classes are open to Women Students. Information as to admission may be obtained on application to the Dean of the Faculty or to the Professor of Architecture.

2. CHEMISTRY AND ASSAYING.

Professors: B. J. HARRINGTON, M.A., Ph.D., LL.D. (Greenshields Professor of Chemistry and Mineralogy).
J. WALLACE WALKER, M.A., Ph.D. (Macdonald Professor of Chemistry).

Lecturers: NEVIL NORTON EVANS, M.A.Sc.

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Demonstrators: ——— ——— ———

Students in all the departments of Applied Science are expected to take up the study of Chemistry in the Second Year, having previously

acquired a knowledge of some branches of Physics in the First Year of their course. They attend a course of lectures, supplemented by tutorial classes, on the laws of Chemical Combination, Chemical Formulae and Equations, the preparation and properties of the more important Elements and their Compounds, etc. They must also devote at least one afternoon a week throughout the session to practical work in the laboratory, where they learn the construction and use of ordinary apparatus, and perform a series of experiments designed to cultivate the powers of observation and deduction. Many of the experiments involve accurate weighing, and for this purpose the elementary laboratory is well supplied with balances. During the second term considerable attention is also devoted to the subject of Qualitative Analysis.

The lectures in the Third Year comprise:—

(a) A course dealing mainly with the methods and reactions employed in chemical analysis, being explanatory of the work done in the laboratory. One lecture a week during the session. (b) A course on the Metals and some of their more important compounds, consisting of two lectures a week during the first term. (c) An elementary course on Organic Chemistry, consisting of two lectures a week during the second term. (d) A course on the composition and analysis of Iron and Steel. One lecture a week during the second term.

The laboratory work of the Third Year comprises an extensive course of Qualitative and Quantitative Analysis, including in the latter case gravimetric, volumetric and electrolytic methods. The analysis of Iron and Steel will be taken up during the second term.

Lectures in the Fourth Year include a systematic course of Organic Chemistry, and a course on Physical Chemistry, each consisting of two lectures a week. In the lectures on Organic Chemistry special attention is paid to the commoner substances which find an application in the Arts. The lectures on Physical Chemistry are divided into two parts. In the first term they include a study of such physical properties of gases, liquids and solids as are known to depend upon their chemical constitution, Thermo-chemistry, and the law of Mass Action. The second term is devoted to Electro-Chemistry, theoretical and applied. The lectures will be based upon the application of the gaseous laws to solutions. This will be followed by descriptions of the most recent applications of Electricity to the production of Metals and Chemicals.

Laboratory work in the Fourth Year will be arranged to suit the requirements of students. Those intending to prosecute organic work will take up a complete course of Organic Preparations and Analysis, but they must also spend some time on the essential physico-chemical

methods; while students of Physical Chemistry must spend enough time in the Organic Laboratory to become familiar with the chief methods of organic work. Those intending to devote themselves to Mineral Chemistry will omit the Organic Chemistry, but must study the more important Physico-Chemical methods, and devote a large amount of time to advanced Mineral Analysis. All students in the Chemistry Course must take up Water and Gas Analysis during the first term.

Laboratory courses will also be provided for students who wish to make a specialty of any particular branch of Industrial Chemistry, such as the Chemistry of Oils, Iron and Steel Analysis, Bleaching, Papermaking, and manufacture of Chemicals, etc.

3. CIVIL ENGINEERING AND APPLIED MECHANICS.

Professor:—HENRY T. BOVEY, M. INST. C. E. (Scott Professor of Civil Engineering and Applied Mechanics).

Assistant Professors:—R. S. LEA, MA.E.
E. G. COKER, M. Sc., A.M. INST. C.E,
Demonstrator:—S. J. ALLEN, B.Sc.

THEORY OF STRUCTURES.

The lectures on this subject embrace:—

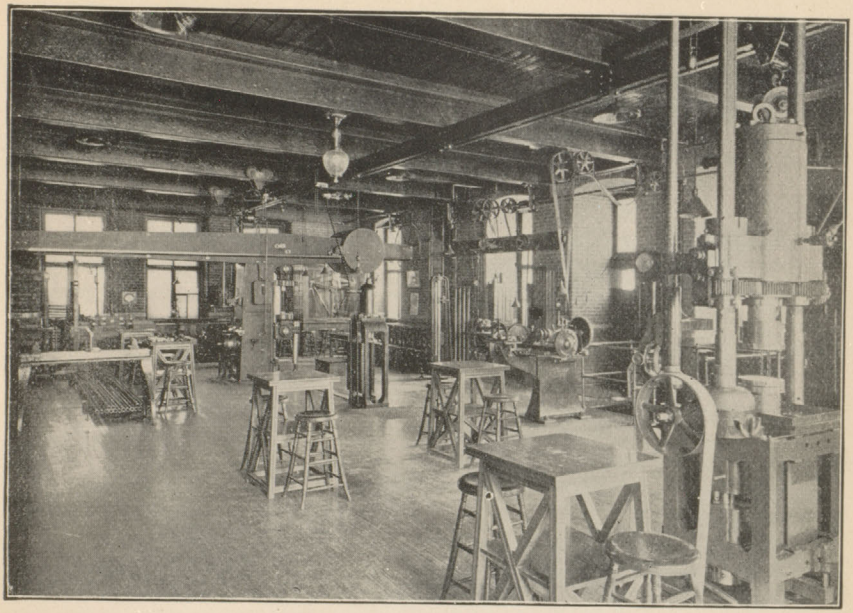
(*a*) The analytical and graphical determination of the stresses in the several members of framed structures, both simple and complex, as, *e.g.*, cranes, roof and bridge trusses, piers, etc.

(*b*) The methods of ascertaining and representing the shearing forces and bending moments to which the members of a structure are subjected.

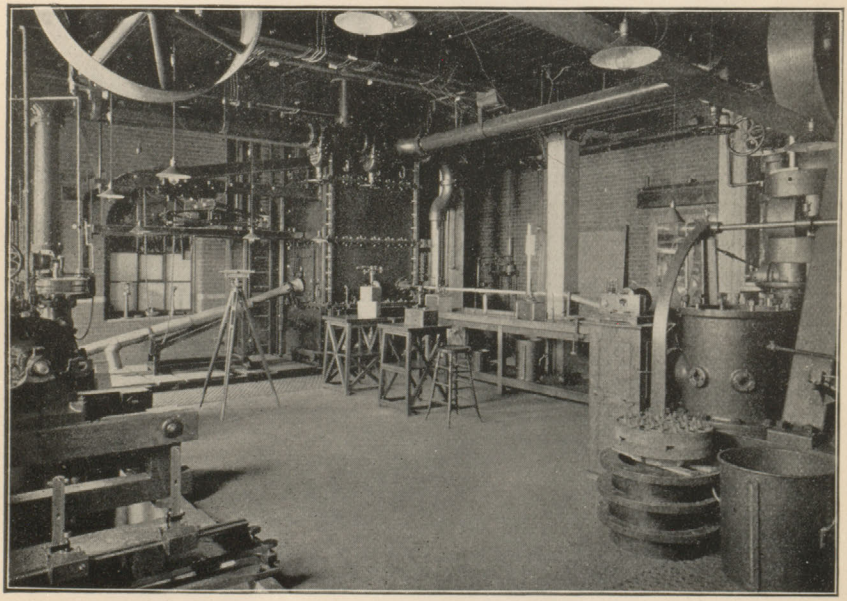
(*c*) A study of the strength, stiffness and resistance of materials, including a statement of the principles relating to work, inertia, energy, together with a discussion of the nature and effect of the different kinds of stress and the resistance offered by a material to deformation and to blows.

(*d*) The design and proper proportioning of beams, pillars, shafts, roofs, bridge piers and trusses, arches, arched ribs, masonry dams, foundations, earth works and retaining walls.

Graphics.—A complete course of instruction is given in the graphical analysis of arches and of bridge, roof and other trusses, and in the graphical solution of mechanical problems. It is therefore possible for the student to apply both the analytical and graphical



An Engineering Testing Laboratory.



Hydraulic Laboratory.

methods of treatment, and thus to verify the accuracy of his calculations.

TEXT-BOOK.—Bovey's Theory of Structures and Strength of Materials.

The Laboratory Work (see also § XII.) is as follows:—

FOURTH YEAR.—During the Fourth Year students are expected to engage in a research upon the physical properties of a material of construction, with special reference to the form and position of such material in the structure.

During session 1899-1900, theses have been prepared on the following:—

(*a*) The flow of steel in tension bars of different sections.

(*b*) The compressive strength of concrete cubes.

(*c*) The strength of steel under combined torsion and bending.

THIRD YEAR.—During the Third Year the laboratory work includes the following.—

(*a*) The Testing of Timber.—Transverse tests of hard and soft timber beams; compressive, bearing, tensile, shearing and torsional tests of specimens from the same beams.

(*b*) The Testing of Iron, Steel and Alloys.—Tensile tests of cast iron, wrought iron and steel beams; tensile, compressive and torsional tests of specimens of mild steel, cast steel, cast iron and alloys.

(*c*) The testing of Bricks, Stones, Slates, etc.—Compressive, absorption and rumbling tests of bricks and stones; transverse, compressive and shearing tests of slates and other materials.

(*d*) The Testing of Concrete and Cement.—Complete tests of concretes and cements, in accordance with the standard methods.

(*e*) Notes on the characteristics, uses, life, methods of preservation, etc., and special tests of the various materials of construction.

BRIDGE CONSTRUCTION.

A course of lectures is given on practical bridge construction, including:

(*a*) The reasons governing the selection of a particular type of bridge;

(*b*) A discussion of the loads to which the bridge will be subjected;

(*c*) The calculations of the stresses in the several members of the bridge;

(*d*) The determination of the sectional areas and forms of the members;

(*e*) The design of the connections;

(*f*) The preparation of complete engineering drawings.

Hydraulics.

The Student is instructed in the fundamental laws governing the equilibrum of fluids, and in the laws of flow through orifices, mouthpieces, submerged (partially or wholly) openings, over weirs, through pipes and in open channels and rivers. The impulsive action of a free jet of water upon vanes, both straight and curved, is carefully discussed, and is followed by an investigation of the power and efficiency of the several hydraulic motors, as, *e.g.*, Reaction Wheels, Pressure Engines, Vertical Water Wheels, Turbines, Pumps, etc.

Text-Book.—Bovey's Hydraulics.

The laboratory work (see also § XII.) will include the following:—

(*a*) *Flow through orifices.*—The determination of the co-efficients of discharge, aelocity, etc.

(*b*) *Flow over weirs.*—The determination of the coefficient of discharge with and without side contraction. Also the measurement of the section of the stream.

(*c*) *Flow through pipes.*—The determination of the effect upon the flow, of angles, bends and sudden changes in section.

(*d*) *Impact.*—The determination of the coefficient of impact.

(*e*) *Motors. etc.*—The determination of the efficiency of Pelton and other wheels, of vortex and other turbines, of centrifugal and other pumps, etc.

Hydraulic Machinery.

The lectures in this Course apply the principles of hydraulics to explain the construction and action of hydraulic machinery, and the design of one or two types is considered in detail.

As far as possible working drawings are used to illustrate the lectures.

Municipal Engineering.

The lectures on this subject will embrace:—

(*a*) *Water Supply.*—The quantity and quality of water; systems and sources of supply; rainfall and evaporation; storage as related to the supplying capacity of water-sheds; natural and artificial purification; distribution, including the location of mains, hydrants, stop-valves, etc., combined or separate fire and domestic systems; details of construction, including dams, reservoirs, pumps, etc.; preliminary surveys, estimates of cost, statistics, etc.

(*b*) *Sewerage of Cities and Towns.*—The various systems for the removal of sewage; special methods in use for its treatment and ultimate disposal; the proportioning and construction of main, branch and intercepting sewers; manholes, flush-tanks, catch-basins, etc.; materials used in construction; estimates of cost.

ELEMENTS OF BUILDING CONSTRUCTION AND FOUNDATIONS.

Lecturers:—Professors Capper and Lea.

These lectures will treat of:—

(*a*) Brick and stone masonry.
(*b*) Timber framing; flooring, beams, columns, centering, etc.
(*c*) Iron and steel framing; girders, columns, etc.
(*d*) Fire-proof and slow-burning construction.
(*e*) The bearing power of the various soils, rocks, etc., as they occur in Nature.
(*f*) The stability and character of the underlying material at any given site, taking into account the effect of frost, erosion, etc.
(*g*) The construction of different kinds of foundations, both on land and in water, by piling, dredging, coffer dams, open and pneumatic caissons, freezing, etc.

4. DESCRIPTIVE GEOMETRY.

Lecturers:—C. H. McLEOD, Ma.E.
H. F. ARMSTRONG.

This course deals with the methods of representing objects on one plane so that their true dimensions may be accurately scaled. It discusses the methods employed in the graphical solution of the various problems arising in engineering design, and deals generally with the principles underlying all constructive drawing. The methods taught are in all cases illustrated by applications to practical problems. It is the aim of the work to develop the imagination in respect to the power of mentally picturing unseen objects, and, incidentally, precision in the use of the drawing instruments is attained.

FIRST YEAR.—Geometrical drawing, orthographic projections, including penetrations, developments, sections, etc. Isometric projection.

SECOND YEAR.—Problems on straight line and plane. Projections of plane and solid figures. Curved surfaces and tangent planes. Intersections of curved surfaces. Axometric projections. Shades and shadows.

THIRD YEAR.—Mathematical perspective and perspective of shadows, etc. Spherical projection and the construction of maps. (This course is given under Surveying and Geodesy, see XI, 14.)

5. ELECTRICAL ENGINEERING.

Professor:—R. B. OWENS, M.A., M.S., E.E. (Macdonald Professor of Electrical Engineering).

Lecturer.—L. A. HERDT, Ma.E., E.E.

Demonstrator:—J. W. FRASER, B.Sc.

Undergraduate Courses.

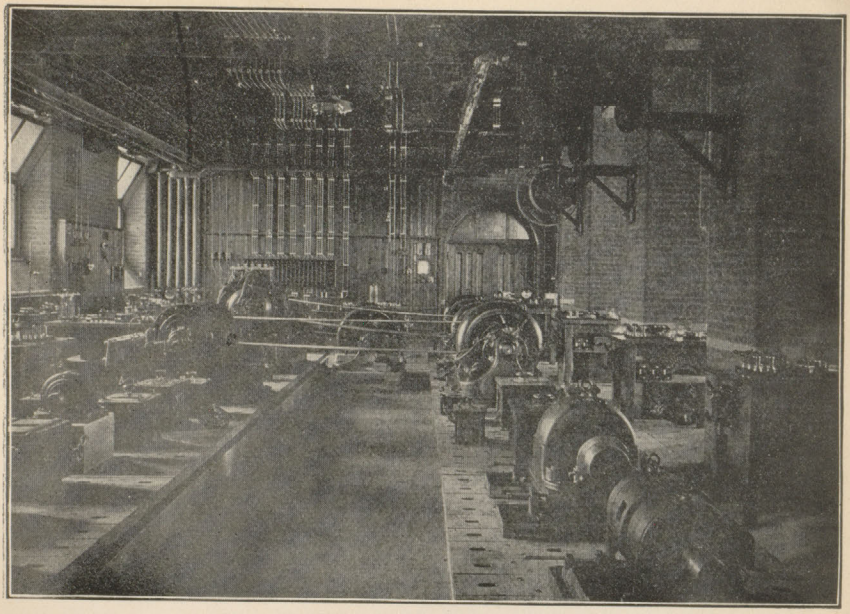
1. Electro-Magnetism and the Magnetic Circuit. The theory and application of the laws of electro-magnetism and the laws of the magnetic circuit. T., Th., at 9—Mr. Herdt. First term.

2. Direct Current Dynamo-Electric machinery. The principles of action of commutating and rectifying machines are discussed, and their practical design considered upon the general lines developed by Hopkinson and Kapp, and used by our best makers. Each student is required to design and make complete drawings of a direct current machine. T. Th., at 9—Professor Owens. Second term.

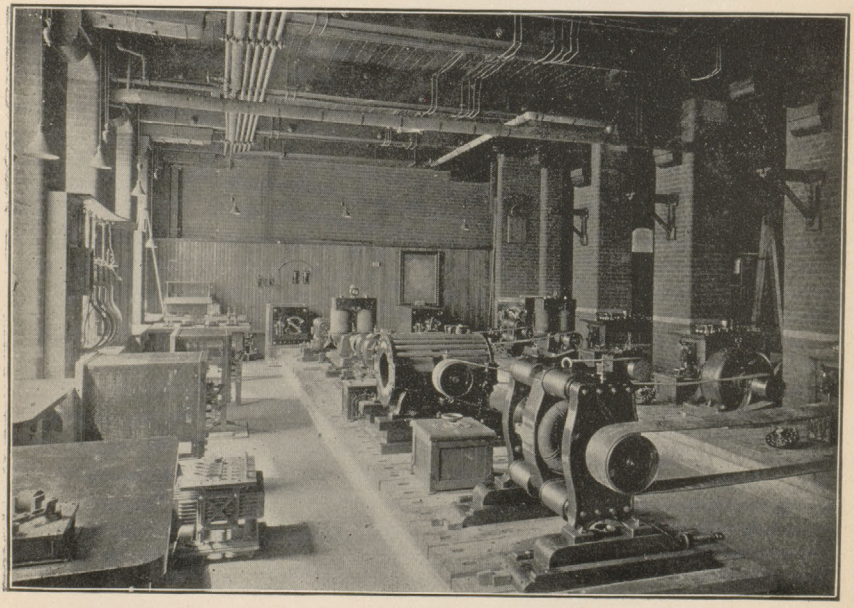
3. Alternating Currents and Alternating Current machinery. Theoretical consideration of variable current flow in circuits containing resistance, inductance and capacity under different conditions. The principles of action of synchronous and induction apparatus. Complete designs of one of more types of alternating current machines are required. M., W., F., at 11—Professor Owens. First and Second term.

4. Electric Lighting and Systems of Electric Distribution. The location, design and operation of central and isolated lighting plants. The design and construction of distributing lines. Arc and incandescent lamps. The application of motors for general power purposes. Each student is required to design a lighting or power plant, making drawings and estimates for its construction, and to make a test of, or a report on, a commercial plant. T., W., F., at 10—Mr. Herdt. First term.

5. Electric Railways and Electricity in Engineering Operations. The location, design and operation of power plants for city and inter-urban service; line and track construction, car equipment. Electric locomotives for special service, electricity in mining, ventilating, hoisting, etc. Station economics. T., W., F., at 10—Mr. Herdt. terms.



In the Dynamo Rooms.



In the Dynamo Rooms.

EXPERIMENTAL CAR.—By the courtesy of the Montreal Street Railway Company, a special testing car, completely equipped for investigating the problems of tramway work, is available.

6. Electrical Engineering Laboratory:

(*a*). Includes such tests of direct current dynamos, motors, boosters, motor-generators, dynamotors, converters, open and closed coil constant current machines, and arc and incandescent lamps as illustrate the principles of their action. T., Th., 2-5. First and Second terms.

(*b*) Includes similar tests upon alternators; synchronous motors, compensators and converters; transformers, potential regulator, reaction coils, frequency and phase-changing apparatus, etc. M., W., F., 2-5. First and Second terms.

7. Telegraphy and Telephony. Single, duplex, quadruplex and multiplex telegraph systems, telephone systems, current generation for telegraph and telephone work, central telegraph and telephone stations. Line construction and testing. Special systems of signalling. One lecture per week, at time to be arranged—Professor Owens. First term.

Graduate Courses.

8. Special problems in the theory and practice of alternating current worning. Two lectures per week at time to be arranged—Professor Owens. First and Second Terms.

9. Advanced Laboratory Investigations. Special research work by Students having necessary previous training—Professor Owens, Mr. Herdt.

10. Electrical Engineering Seminar. Weekly meetings are held, at which students present carefully prepared papers upon current engineering literature and special topics in connection with their studies or their laboratory work—Professor Owens, Mr. Herdt.

6. ENGLISH LANGUAGE AND LITERATURE.

Professor:—C. E. MOYSE, B.A. (Molson Professor of English Language and Literature).

Lecturer:— .. ..

A special course in English Composition is prescribed for all students in the First Year. The general aim of this Course is to train the students to express themselves in good English, and to cultivate in them readiness and accuracy of perception in matters of thought and style. Essays on current events and on popular and literary sub-

jects, based on selections from the writings of well-known authors, are written weekly.

VACATION WORK.—During the vacation, students entering the Second Year are expected to read certain selected standard works in literature and fiction, and are required to pass an examination based upon a knowledge of the textual matter of such works. The marks obtained in this examination will be reckoned in determining the relative standing at the sessional examinations at the end of the Second Year.

The works selected for the vacation of 1900 are:—

Shakspeare's Tempest, ed. Deighton (Macmillan);

Scott's Waverley;

Goldsmith's Vicar of Wakefield;

Selections from the Spectator, edit. by Deighton (Macmillan).

French Students may substitute for the above the following:—

Corneille—Le Cid, Horace.

V. Hugo—Hernani, Ruy Blas.

Balzac—Eugenie Grandet.

Students will also be required to possess some knowledge of the lives of the above authors, and of the theories of literary art which they severally represent.

7. EXPERIMENTAL PHYSICS.

Professors:—JOHN COX, M.A. (Macdonald Professor of Physics).
E. RUTHERFORD, M.A. (Macdonald Professor of Physics).

Demonstrators:—ROBERT O. KING, M.A.Sc.
R. M. MCCLUNG, B.A.
R. M. MCCLUNG, B.A.

The instruction includes a fully illustrated course of Experimental Lectures on the general Principles of Physics (embracing, in the Second Year—*The Laws of Energy—Heat, Light and Sound;* in the Third Year—*Electricity and Magnetism),* accompanied by courses of practical work in the Laboratory, in which the Students will perform for themselves experiments, chiefly quantitive, illustrating the subjects treated in the lectures. Opportunity will be given to acquire experience with all the principal instruments used in exact physical and practical measurements.

LABORATORY COURSE.—Three hours per week spent in practical measurements in the Macdonald Physical Laboratory in conjunction with the lecture courses.

Sound.—Velocity of Sound; determination of rates of vibration of tuning forks; Resonance; laws of vibration of strings.

Light.—Photometry; Laws of Reflection and Refraction; focal lengths and magnifying powers of mirrors, lenses, telescopes and microscopes; the sextant; spectroscope, spectrometer, diffraction grating, optical bench, polariscopes.

Heat.—Construction and calibration of thermometers; melting and boiling points; air thermometer; expansion of solids, liquids and gases; calorimetry; pyrometry.

Magnetism and Electricity.—Measurements of pole strength and moment of a magnet; the magnetic field; methods of deflection and oscillation; comparison of moments and determination of the elements of the earth's magnetism; frictional electricity.

Current Electricity.—A complete course of measurements of current strength, resistance and electromotive force; calibration of galvanometers; the electrometer; comparison of condensers; electromagnetic induction.

SECOND YEAR.—Electrical Engineering Students are given an extra laboratory period of 3 hours per week, which allows of a more extended and complete course of experimental work.

THIRD YEAR.—Students of Electrical Engineering will continue their work in the Physical Laboratory in the Third Year. The following is a brief outline of the course:—

Magnetic elements and measurements. Use of Variometers. Testing magnetic qualities of iron.

Theory and practice of absolute electrical measurements.

Comparison and use of electrical standards of resistance, E.M.F., self-induction and capacity.

Principles of construction of electrical instruments.

Testing and calibration of ammeters, voltmeters and wattmeters.

Insulation and capacity tests. Electrometers and Ballistic methods.

Construction and treatment of storage cells. Testing for capacity and rate of discharge.

Electric light photometry.

An additional course on telegraph and telephone work is under consideration.

The following are some of the sections in which special provisions have been made for advanced physical work:—

Heat.—Thermometry. Comparison and verification of delicate thermometers. Air themometry. Measurement of high temperatures. Electrical resistance thermometers and pyrometers. Thermo-electric pyrometers.

Calorimetry. Mechanical Equivalent of Heat. Variation of spe-

cific heat with temperature. Latent heat of fusion and vaporisation. Heat of solution and combustion. Electrical methods.

Radiation and conduction of heat with special methods and apparatus. Dynamical theory of gases.

Viscosity. Surface Tension. Variation of properties with temperature.

Light.—Photometric standards. Spectro-photometry. Theory of colour vision. Spectroscopy and spectrum photography. Compound prism spectrometers. Six inch and 2½ inch Rowland Gratings. Study of spectra of gases. Fluorescence and anomolous dispersion. Polarimetry. Landolt and other polarimeters. Form of wave surface.

Sound.—Velocity in gases and various media. Absolute determinations of period. Harmonic analysis of sounds. Effects of resonance and interference.

Electricity and Magnetism.—Magnetic properties. Influence of stress and torsion. Influence of temperature. Effects of hysteresis. Magneto-optics. Other effects of Magnetisation. Diamagnetism.

Electrical standards and absolute measurements. Calibration of electrical instruments.

Insulation and capacity testing. Electrometer and Ballistic methods Temperature variation of resistance and E.M.F. Thermo-electric effects. Electrolysis. Chemistry of primary and secondary batteries. Resistance of Electrolytes, Polarisation.

Electric discharge in gases and high vacua. Dielectric strength. Behaviour of insulators under electric stress. Specific inductive capacity. Electro-magnetic optics. Alternating currents of high frequency and voltage. Electrical waves and oscillations. Discharge of electrification by Röntgen rays, ultra-violet uranium and thorium radiations.

Professor Cox will give a special course of lectures to advanced and graduate students, on "the relations between optics, electricity and magnetism," following the course given by Prof. Rutherford on "electric oscillations."

N.B.—Students taking a Graduate Course will receive guidance in any advanced Mathematics required in connection with their work.

8. FREEHAND DRAWING, LETTERING, ETC.

Assistant Professor:—H. F. Armstrong.

In the *Freehand Course*, the object is to train the hand and eye so that students may readily make sketches from parts of machinery, etc., either as perspective drawings in light and shade, or as preparatory dimensioned sketches from which to make scale drawings.

In the Drawing Rooms.

Carpenter Shop

In the *Lettering Course*, plain block alphabets, round writing and titles will be chiefly dealt with. In this course, also, tinting, tracing, blue printing and simple map drawing will be included.

9. GEOLOGY AND MINERALOGY.

Professors:—B. J. HARRINGTON, M.A., Ph.D., LL.D.
FRANK D. ADAMS, M.A.Sc., Ph.D.

Demonstrator:—OSMOND E. LEROY, B.A.

The courses are arranged as follows:—

THIRD YEAR.—

GENERAL GEOLOGY.—The lectures will embrace a general survey of the whole field of Geology, and will be introduced by a short course on Mineralogy. Especial attention will be devoted to Dynamical Geology and to Historical Geology, including a description of the fauna and flora of the earth during the successive periods of its past history, as well as to the economic aspects of the subject.

The lectures will be illustrated by the extensive collections in the Peter Redpath Museum, as well as by models, maps, sections and lantern slides. There will be an excursion every Saturday until the snow falls, after which the excursion will be replaced by a demonstration in the Museum.

Books of Reference.—SCOTT, An Introduction to Geology; DANA, Manual of Geology.

MINERALOGY.—Lectures and demonstrations illustrated by models and specimens in the Peter Redpath Museum. Among the subjects discussed are: Crystallography; physical properties of minerals dependent upon light, electricity, state of aggregation, etc.; chemical composition, calculation of mineral formulae, quantivalent ratios, etc.; principles of classification, description of species.

DETERMINATIVE MINERALOGY.—Laboratory practice in blowpipe analysis and its application to the determination of mineral species.

FOURTH YEAR:—

MINERALOGY (In continuation of the course in Third Year)—Description of species, particular attention being paid to those which are important as rock constituents and to the economic minerals of Canada.

PETROGRAPHY.—The modern methods of study employed in Petrography are first described, and the classification and description of rocks is then taken up.

In addition to the lectures, one afternoon a week during the second term will be devoted to special microscopical work in the Petrographical Laboratory.

Text-Book.—HARKER, Petrology for Students.

PRACTICAL GEOLOGY AND ORE DEPOSITS.—The methods of observing and recording geological facts and carrying out geological surveys are explained and illustrated. Certain geological structures which are of especial importance from the standpoint of Applied Geology are then described in some detail, and the course concludes with a general treatment of the nature and mode of occurrence of Ore Deposits. The course will be illustrated by maps, models, specimens and lantern slides.

Text-Books.—GEIKIE, Outlines of Field Geology; KEMP, Ore Deposits of the United States; PHILLIPS and LOUIS, A Treatise on Ore Deposits.

CANADIAN GEOLOGY.—A general description of the Geology and Mineral Resources of the Dominion.

PETROGRAPHICAL LABORATORY.—See § XII, 11.

GEOLOGICAL COLLOQUIM.—A discussion each week during second term of some Geological topic, references to the literature of which have been given by the Professor in the week preceding. The course is intended to give students some acquaintance with Geological literature, as well as a wider knowledge of the great principles which underlie the Science.

PALÆONTOLOGY.—(For students taking Honours.) Special studies of some of the more important groups of fossils.

Books of Reference.—NICHOLSON and LYDEKKER, Manual of Palaeontology; ZITTEL, Text-Book of Palaeontology.

A course of Advanced Physical Geography will be substituted for that on Palaeontology this year.

NOTE.—Students of the Mining and Chemistry courses take all the Mineralogy of the Third Year. Mining Students take all Courses of the Fourth Year. Chemistry Students take, in addition to the Geology of the Third Year, the Mineralogy of the Fourth Year.

The Petrographical Laboratory is open to Fourth Year Mining Students during the second term.

10. MATHEMATICS AND MATHEMATICAL PHYSICS.

Professor:—G. H. CHANDLER, M.A.
Lecturer:—R. S. LEA, Ma.E.

The work in this department is conducted from the outset with special reference to the needs of Students of Applied Science. Much time is given to practice in the use of Mathematical Tables, particular

attention being paid to the solution of triangles, the tracing of curves, graphical representation of functions, reduction of observations, etc. Areas, volumes, masses, centres of gravity, moments of inertia etc., are determined both by calculation and by observation or experiment, and each methol is made to supplement or illustrate the other. In this connection, use will be made, in actual laboratory practice, of a large amount of apparatus, such as balances, Atwood's machines, inclined planes, chronographs, rotation apparatus of various kinds, etc. The different methods of approximation and the reduction of results of experinents and observations will also receive due attention.

The lectures will embrace the following subjects:—

First Year.—Euclid, to the end of Book VI., with exercises on Loci, Transversals, etc., Algebra, including the Binominal Theorem, Elements of Soid Geometry and of Geometrical Conic Sections. Plane and Spherical Trigonometry. Elementary Kinematics and Dynamics (including Statics and Hydrostatics).

Second Year—Analytic Geometry. Differential and Integral Calculus. Dynamics of Solids and Fluids.

Third Year.—Continuation of Analytic Geometry, Calculus and Dynamics.

Classes may also be held for advanced (optional) work in these or other subjects.

N.B.—Students taking Graduate Courses will receive guidance in any advanced Mathematics required in connection with their work.

Text-Books (Partial list).—Todhunter's or Mackay's Euclid, Hall & Knight's Elementary Algebra, Wilson's Solid Geometry and Conic Sections, Wentworth's Analytic Geometry, Chandler's Calculus. Blakie's Dynamics, Wright's Mechanics, Bottomley's Mathematical Tables, Chambers' Mathematical Tables.

11 MECHANICAL ENGINEERING.

Professor:—R. J. Durley, B.Sc., Ma.E., A.M.Inst. C.E.
(Workman Professor of Mechanical Engineering).
Lecturer:—H. M. Jaquays, M.A., M.Sc., A.M.Can.Soc.C.E.
Demonstrator:—E. G. M. Cape, B.A.Sc.

1. Descriptive Mechanism. (Monday, 12.)

Workshop processes in mechanical engineering. Action of cutting tools and machine tools. Manufacture and use of various parts and details of typical machines. Forms of stationary, marine, and locomotive engines and boilers; types of pumping and ventilating machinery, gas and oil engines, air compressors, and refrigerating machinery.

Book of Refereice:—Lineham's Mechanical Engineering , (Chapman & Hall.)

2. KINEMATICS OF MACHINES. (Wednesday, 11; Thursday, 10)

Definitions. Mechanisms and machines. Kinematic pairing. Velocity and acceleration in mechanisms. Centrodes. Restraint in mecanisms. Analysis of the quadric crank chain, the slider-crank chain, and the double-slider crank chain. Higher pairing in mechanisms. Cams, Ratchet and click trains. Chamber-crank and chamber-wheel trains. Mechanisms involving non-rigid links. Screw motion and spheric motion in mechanisms.

Book of Reference:—Kennedy's Mechanics of Machinery. (Macmillan.)

3. DYNAMICS OF MACHINES.

THIRD YEAR.—(Monday, 10., Wednesday, 9). Elementary dynamics of the steam engine. Diagrams of crank effort. Fluctuation of energy and speed. Flywheels. Friction of journals and pivots. Graphic treatment of friction in mechanisms. Brakes. Dynamics of belt and rope driving. Transmission and absorption dynamometers.

FOURTH YEAR.—(Tuesday, 9, Wednesday, 10. Thursday, 12.) Balancing of double and single acting engines. Dynamics of the connecting rod. Gyrostatic action in machines. Theory of governors. Graphic methods in dynamics. Vibration in machines. Knocking of steam engines.

4. MACHINE DESIGN.

THIRD YEAR.—(Thursday, 11). Principles of the Strength of Materials as applied to the design of the parts of machines. Fastenings used in machine construction, bolts, screws, keys, cotters, rivets and riveted joints. Journals and bearings. Shafts and couplings.

FOURTH YEAR.—(Monday, 9.)—Design of wheel gearing. Belts, ropes, and pulleys. Pipes and pipe joints. Cylinders. Eccentrics, pistons and piston rods, connecting rods, cross-heads and other engine details. Flywheels. Design of valves and valve gears.

Text-Book:—Unwin's Machine Design (Longmans, 2 Vols.).

Book of Reference:—Low and Bevis' Machine Drawing and Design, (Longmans).

5. MECHANICAL DRAWING AND DESIGNING.

SECOND YEAR.—(Monday and Thursday).—Elementary principles of mechanical drawing and draftsmanship. Preparation of working drawings of simple machine details. Making dimensioned sketches of machines and their parts. Dimensioning and conventional colouring of drawings. Preparation of tracings.

THIRD YEAR (Monday and Thursday, 2).—Designing of simple machine parts. More difficult exercises in mechanical drawing. Engine designing.

FOURTH YEAR (Monday and Thursday, 2).—The complete design of a machine, such as a steam engine, a pump, or a machine tool, is worked out, and the requisite working drawings and tracings are prepared.

6. MECHANICAL ENGINEERING (Thursday, 10; Friday, 9).

Steam boilers and steam production. Fuel and Combustion. Corrosion and defects of boilers. Boiler Installations.

The Steam Engine; estimation of power developed under various conditions. The indicator and its diagrams. Steam distribution, and performance of pumping and air-compressing machinery, as shown by the indicator. Economy of steam machinery. Gas and oil engines. Gas producers. Mechanical distribution of power, and losses of power, in power installations and workshops. Steam engine valves and valve gears. Valve diagrams. Speed regulation in steam engines. Lubrication in steam engines. Steam turbines and engines for special services. Relation between weight and power in steam machinery. Marine engines and ship propulsion. Elements of locomotive engineering. Tractive force in locomotives. Train resistance. Brakes. Refrigerating machinery.

Books of Reference:—Ewing's The Steam Engine (Camb. Univ. Press); Lineham's Mechanical Engineering (Chapman & Hall); Hutton's Mechanical Engineering of Power Plants (Wiley).

7. THERMODYNAMICS. See page 169.
8. LABORATORY INSTRUCTION. See pages 180, 188.
9. WORKSHOP PRACTICE. See page 191.

Graduate Courses.

The Graduate Courses in Mechanical Engineering comprise experimental research work of the following kinds:—

Tests of the economy and performance of steam engines and boilers, hot air and gas engines, and air compressors. Experiments on the behaviour of superheated steam, on cylinder condensation, on feed heating, and on the value of fuels. Experiments on the properties and relative values of lubricants, on transmission and absorption dynamometers, on the efficiency of transmission machinery and of machine tools. Tests of fans and blowers. Experiments on the flow of air and of steam. Researches on the tempering and weld-

ing of various materials, on the properties of alloys and on the action of cutting tools.

12. METEOROLOGY.

Instruction in Meteorological Observations will be given in the Observatory at hours to suit the convenience of the Senior Students.

Certificates will be granted to those Students who pass a satisfactory examination on the construction and use of Meteorological Instruments, and on the general facts of Meteorology.

13. MINING AND METALLURGICAL ENGINEERING.

Professor:—JOHN BONSALL PORTER, Ph.D., M.Inst.C.E., (Macdonald Professor of Mining and Metallurgy).

Lecturer:—F. W. DRAPER B.Sc. (Macdonald Lecturer in Metallurgy and Assaying).

Demonstrator:—E. ANDREWES, B.Sc.

Fellow:—P. W. K. ROBERTSON, B.Sc. (Dawson Fellow in Metallurgy).

I. The Undergraduate Courses in detail are as follows:—

MINING.

THIRD YEAR.—(1) Ore Dressing. One lecture a week on the theory and practice of ore dressing and coal washing.—Treatment of ores underground and at the surface, hand picking, crushing and sizing, separating, vanning, jigging, etc.

Mill machinery and appliances; breakers, rolls, screens, jigs, vanners, tables, washers, buddles, magnetic separators, etc. (25 lectures).

Laboratory, see (2).

(2). Laboratory course for (1). Simple examinations and tests of ores, sands and gravels, by means of pan, vanning shovel, hand jig, magnet, classifier, etc., giving experience in prospecting and testing without the aid of machinery, (40 hours). Further laboratory in Fourth Year, see (5).

FOURTH YEAR.—(3). Two lectures a week on Principles of Mining. Prospecting, sinking, drifting, developing, methods of mining, timbering, hauling, hoisting, drainage, lighting, ventilating, etc. Mine accidents and their prevention; general arrangement of plant, administration, stores and dwellings, etc. Mining law (25 lectures—see also 4).

(4). Two lectures a week in First, and one lecture a week in Second Term on Mining, Ore Dressing and Metallurgical Machinery, and three hours a week in drawing room and laboratory on Mining and

Metallurgical design. Mining and ore dressing machines and metallurgical appliances. (37 lectures and 75 hours in drawing-room, etc.)

(5). One day a week in the Ore Dressing Laboratory. Tests of ores, adjustment and use of machines: Horse-power and efficiency determination for different machines under varied conditions. Mill tests, etc., etc. (150 hours.)

NOTE.—Students especially interested in Metallurgy are permitted to give a part of this time to Metallurgical work. See Metallurgy, 9 and 10.

(6). Mining Colloquium.—One hour a week is given to an informal discussion of the work being done in the department, and of other matters relating to Mining and Ore dressing.

METALLURGY.

THIRD YEAR.—(1). One lecture a week in general elementary metallurgy—including introduction, fuels, furnaces and refractory meterials, typical metallurgical operations and reactions, iron smelting, etc. (25 lectures.)

(2). One lecture a week in First Term on Elementary Metallurgy arranged with especial reference to the needs of Students in Mechanical Engineering. (12 lectures.)

(3). Fire Assaying Laboratory. Assaying appliances. Furnaces, crucibles, scorifiers, cupels, etc. Pulp and button balances, and wet assay apparatus. Sampling and preparation of ores for assay; preparation and choice of fluxes and reagents, charges, methods, etc. Assays of gold and silver ores. Assays of lead ores. Parting of bullion, and assays of base bullion. Demonstrations and lectures, and 50 hours' laboratory work.

FOURTH YEAR.—(4). One hour a week in Metallurgy of Gold and Silver, etc. Extraction of precious metals from free milling ores; stamp mill amalgamation, amalgamating pans and barrels, patio process, etc. Extraction from refractory ores, roasting chlorination, cyanide process, special methods, etc. Laboratory as in (9). (25 lectures.)

(5). One hour a week on the manufacture and properties of Iron and Steel, etc. Fuels, including calorimetry, pyrometry and furnace efficiencies. With laboratory as in (9) and (10). (25 lectures.)

(6). One hour a week on the Metallurgy of Copper, Lead, Zinc, Nickel, etc. Sampling and mixing of ores; calcination and roasting; mechanical calciners; smelting in reverberatory and shaft furnaces; matte fusions; Bessemerizing, refining, desilverizing, parting, etc. Wet methods; etc. Laboratory as in (9). (25 lectures.)

(7). One hour a week for one term on advanced Metallurgy, slag

calculations, etc., etc., with laboratory as in (9). (12 lectures.) (Optional with Hydraulics.)

(8). One hour a week for one term in Electro Metallurgy of Copper, Silver, Aluminum, Nickel, etc. Laboratory as in (9). (12 lectures). (Optional with Hydraulic Machinery.)

(9). Metallurgical Laboratory. Use of furnaces—roasting, smelting, refining, etc. Pyrometry and tests of refractory materials. Flue gases and flue dust. Electro metallurgy, cyaniding, chlorinating, amalgamating, etc. (100 hours in laboratory with demonstrations.) See also Note— Mining (5).

(10). A short course in Metallurgical laboratory on calorimetry and elementary pyrometry, flue gases, etc., in connection with (5). (24 hours, with additional time, special cases.)

This course is for both Mechanical and Mining Students, being the only laboratory work for the former.

Optional Courses are offered as above in second term of Fourth Year in Advanced and Electro Metallurgy, Mineral Chemistry, Electro Chemistry and Hydraulics. One of these several options must be taken. (25 lectures and laboratory work.)

(11). Metallurgical Colloquium.—About one hour per week is given to an informal discussion of the work being done in the department, and of other matters relating to Metallurgy.

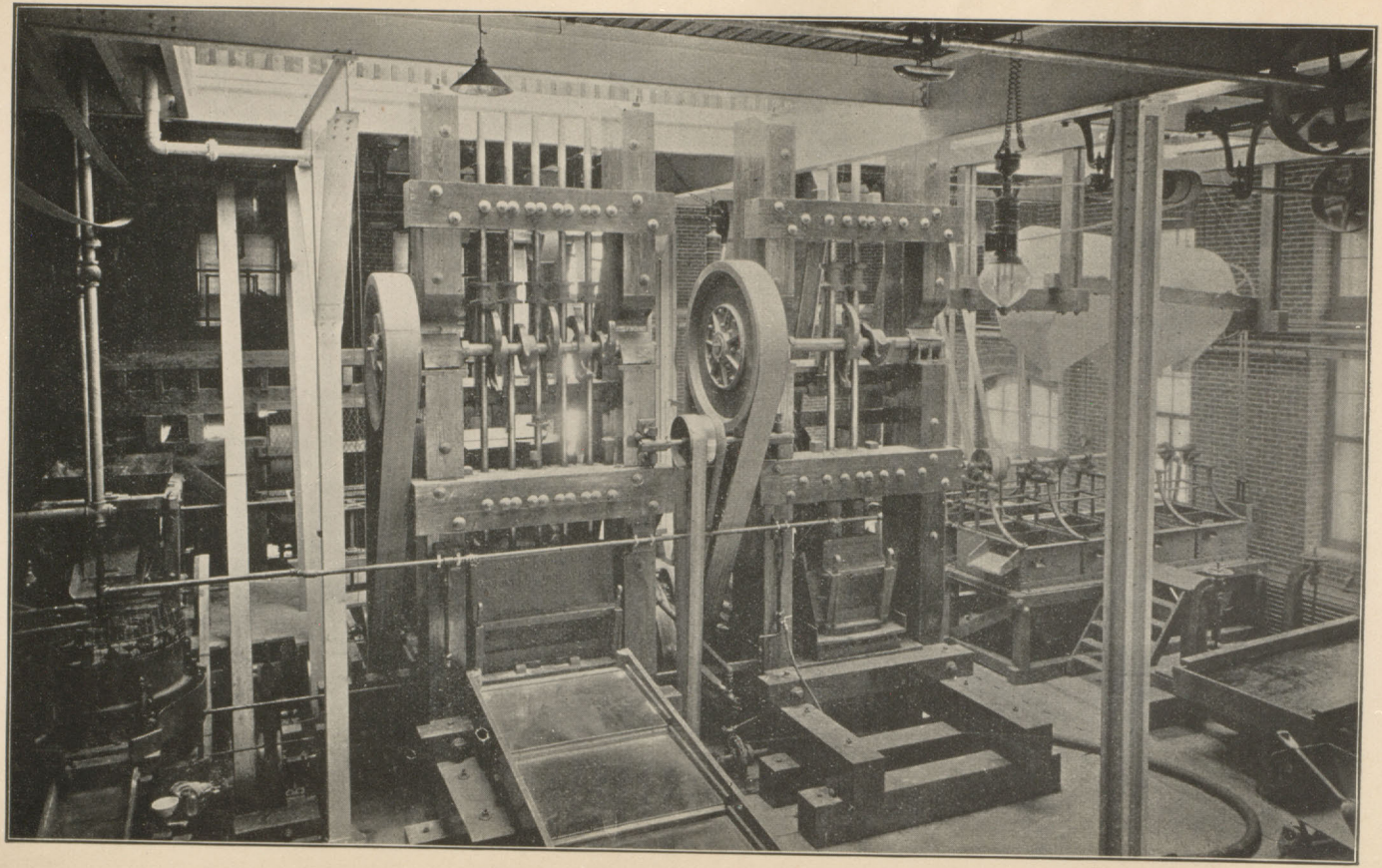
Graduate Courses.

Special courses in advanced work are also offered in both Mining and Metallurgy, and these courses, owing to the unequalled equipment of the new laboratories, as detailed below, can be made exceedingly valuable both theoretically and practically.

Text-books:—No set text-books are used, but students are recommended to freely consult the following works of reference, in addition to the special references given from time to time:—

C. Le Neve Foster's Ore and Stone Mining; H. W. Hughes' Coal Mining; M. C. Ihlseng's Manual of Mining; W. B. Kunhard's Ore Dressing in Europe; T. A. Richard's Stamp Mining of Gold Ores; H. Louis' Handbook of Gold Milling; T. K. Rose's Metallurgy of Gold; C. Schnabel's Handbook of Metallurgy; E. D. Peters' Modern Methods of Copper Smelting; H. O. Hoffman's Metallurgy of Lead; T. Turner's Metallurgy of Iron; H. M. Howe's Steel; H. H. Campbell's Manufacture and Properties of Structural Steel; F. L. Bosqui's Notes on the Cyanide Process.

III. Laboratories.—The admirable laboratories of the University are of peculiar advantage to students in the Mining Course, and



Milling Room in the Mining Department.

enable them not only to become acquainted with the theory of their subject, but to personally investigate its methods on a large scale.

During the first three years of the course, the students do systematic work in the several workshops and laboratories. During the last part of the Third and the chief part of the Fourth Year they spend a large proportion of their time in the working laboratories for Ore Dressing and Metallurgy. (See § XII). In these latter, the general method is first to conduct before the whole class a limited number of important typical operations in ore dressing and metallurgy, and then to assign to each student certain methods which he must study out in detail, and upon which he must experiment and make written report. In this work he is guided by the professors and demonstrators, and assisted by the other students, each of whom he must in turn assist in his special work. In this way every student acquires detailed knowledge of certain typical operations and a fair general experience of all of the important methods in use.

IV. Illustrations, Museums, Societies, Etc.—In addition to a large series of lantern slides, the department already owns a collection of fifteen hundred photographs, more than half of which are kept in series in duplicate, and loaned to students for the session; and arrangements are being made to furnish sets of these, at cost price, to such students as wish to retain them. This collection is rapidly being enlarged.

The Museum of the new building contains suites of ores, fuels and metallurgical materials, models of mines and furnaces, and specimens of finished products.

The McGill University Mining Society meets fortnightly to read and discuss papers by graduate and student members, and from time to time to hear lectures given by gentlemen eminent in the profession.

V. Excursions are made by the classes, from time to time, to such metallurgical works and mining establishments as are within reach.

VI. Summer School.—The summer vacation class in Mining instituted in 1897 is now a fixed part of the course. All students of Mining in regular course are required to attend this class in the vacation between the Third and Fourth Years, and students passing from the Second to Third Year are advised to do so also.

The school was held in 1898 at the mines of the Dominion Coal Company in Cape Breton and at the Richardson and Hurricane Gold Mines in Nova Scotia. In 1899 the anthracite mining region of Pennsylvania, and the great iron and steel works near Philadelphia were visited. This year the school is being held in British Columbia, and the itinerary includes excursions to nearly all of the important camps and smelters.

The purpose of the school is to show the students by actual example

the relations that obtain between theory and practice in engineering, and to acquaint them sufficiently with the methods and details of practical mining and metallurgical work to enable them to appreciate the technical details of the final year's teaching.

About six weeks are spent by the class in visiting mines and furnaces and studying their operation. The professor of mining and his assistant go with the class, and give daily explanations and demonstrations. The students take notes and sketches, and at the end of the school each student writes up these notes in the form of a report, and these reports are accepted as the Summer Essays required by the Faculty.

Aid to Students.—The instruction given during this summer course is free to all mining students, and the only expense to them is the cost of board, lodging, and railway fares, and every effort is made to keep these expenses as low as is practicable.

As some students may have difficulty of finding even this sum in addition to the cost of the regular course, a fund has been provided by Sir William Macdonald, and deserving students who require aid can have money advanced them by applying to the professor of mining.

14. SURVEYING, GEODESY AND TRANSPORTATION.

Professor:—C. H. McLeod, Ma.E.
Lecturer:—J. G. G. Kerry, Ma.E.

Surveying and Geodesy.

This course is designed to give the student a theoretical and practical training in the methods of land and geodetic surveying, in the field work of engineering operations, and in practical astronomy. The course is divided as follows:—

Second Year.—Chain and angular surveying; the construction, adjustment, use and imitations of the various instruments. Underground surveying. Topography, levelling, contour surveying. Simple curves and setting out work. Descriptions for deeds. General land systems of the Dominion and Provinces.

Third Year.—Construction surveying, including the location of roads, transition curves, setting out work and calculation of quantities. Geodetic, trigonometric and baromet ic levelling. Topographic and photographic surveying. Hyd ographic surveying. Introduction to practical astronomy. Graphical determination of spherical triangles, spherical projections, construction of maps. Mathematical perspective and the perspective of shades and shadows.

In the field the students of the Second and Third Years are re-

quired to carry out the following:—(1) A chain survey. (2) A chain and compass survey. (3) A pacing survey. (4) A compass and micrometer survey. (5) A contour survey. (6) A plane table survey. (7) A survey and location of a line of road with determination of topography and contours and subsequent staking out for construction. (8) A hydrographic survey of a river channel, including measurement of discharge. (9) A survey at night illustrating underground methods. Astronomical observations with sextant and engineer's transit.

All students are required to keep complete field notes, and from them prepare maps, sections and estimates of the work.

The large drawing rooms are furnished with fixed mountings for the various instruments, in order to permit of their use and investigation during the winter months.

FOURTH YEAR.—Practical Astronomy:—the determination of time, latitude, longitude and azimuth. Geodesy:—figure of the earth; measurements of base lines and triangulation systems; adjustments and reductions of observations.

The field work of the Fourth Year consists in the measurement of a base-line, in triangulations and precision levelling.

The practical work in astronomy (for equipment of observatory see § XII, 6) comprises: (1). Comparisons of clocks and chronometers. (2) Determination of meridian by solar attachment. (3) Meridian, latitude and time by solar and stellar observations with the engineer's transit. (4) Latitude and time by sextant. (5) Time by astronomical transit. (6) Latitude by zenith telescope. (7) Latitude by transit in prime vertical.

Field work is required of all students of the Second and Third Years in the courses of Architecture, Civil and Mining, and of the Fourth Year in the Civil course. The work will begin on the first of September, and continue through the entire month. The surveys will be made in a place some distance from Montreal. Suitable provision for board and lodging will be arranged for at the place selected.

Exercises in the Geoderic laboratory (for equipment see § XII, Art. 6) carried out in the Fourth Year include the following:—(1) Measurement of magnifying power. (2) Determination of vernier errors. (3) Errors of graduation. (4) Measurement of eccentricity of circles. (5) Determination of errors of run of theodolite microscopes. (6) Investigation of the errors of a standard bar. (7) Graduating scales with the dividing engine, and comparison thereof on the comparator. (8) Investigation of the errors of circles on the circular comparator. (9) Determination of the constants of steel tapes. (10) Investigation of the graduation errors of steel tapes on the fifty-foot comparator. (11) Investigation of the errors of aneroid

barometers. (12) Investigation of the errors of level tubes, and determination of their scale values. (13) Measurement of the force of gravity with a reversible pendulum. (14) Measurements of magnetic dip, declination and horizontal force.

The equipment of the surveying department comprises the following, in addition to the apparatus of the Observatory and Geodetic Laboratory:—Eleven transit theodolites by various makers, with solar and mining attachments. A photo-theodolite, 8-in. alt-azimuth, Seven dumpy and three wye levels. Hand levels and clinometers. Two precision levels. Five surveyors' compasses. Three prismatic compasses. Pocket compasses. One solar compass. Three marine sextants. Artificial horizons. Four box sextants. Two reflecting circles. Two large plane tables. Four traverse plane tables. Four current meters. Rochon micrometer. Double image micrometer. Field-glasses. Two heliotropes. Several barometers. 300 ft. and 500 ft. steel tapes suitable for base measurements. Steel chains and steel bands. Linen and metallic tapes. Sounding lines. Pickets. Levelling rods. Micrometer targets. Slope rods. Pedometers. Station pointer, pantographs, planimeter, slide rules and minor appliances.

Examinations for Land Surveyors:—Any graduate in the Faculty of Applied Science, in the Department of Civil Engineering and Land Surveying, may have his term of apprenticeship shortened to one year for the profession of Land Surveyor in Quebec or Ontario or for the profession of Dominion Land Surveyor.

Text-books.—Gillespie's Surveying, Johnson's Theory and Practice of Surveying, Shortland's Nautical Surveying, Green's Practical and Spherical Astronomy, Nautical Almanac, Baker's Engineers' Surveying Instruments.

Transportation.

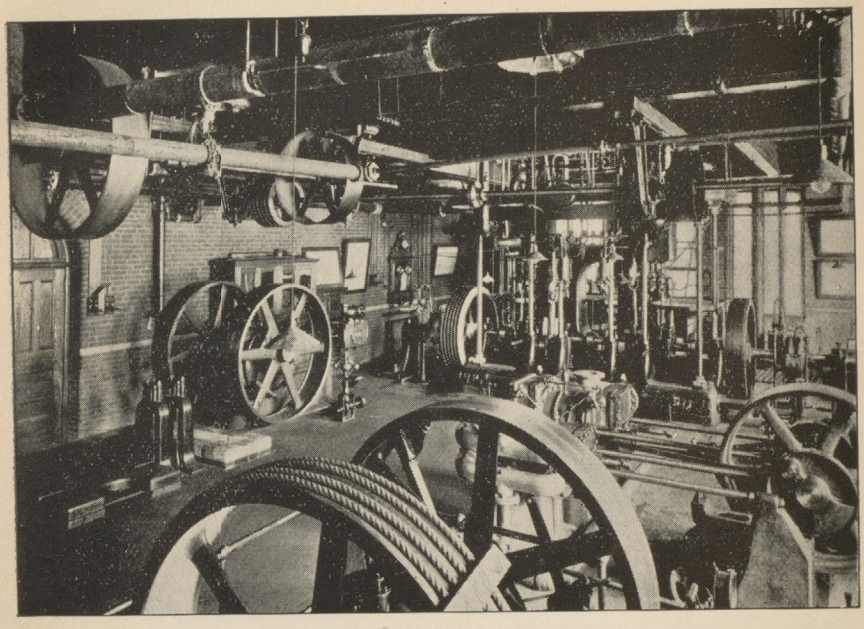
On Common Roads, Railways and Canals.

The lectures will embrace:—

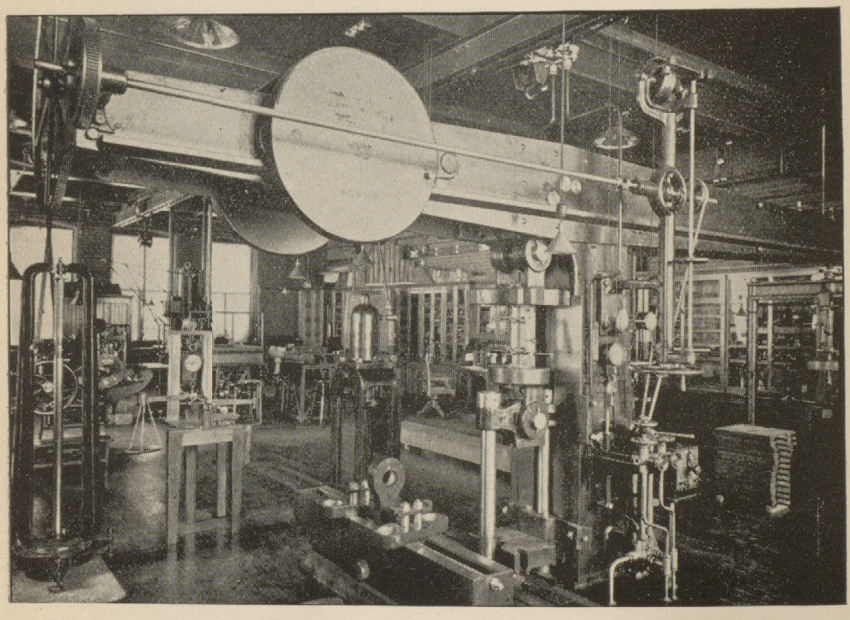
(*a*) A brief historical review of the inception and carrying out of the great Canadian systems of transportation, and a resumé of the laws governing them.

(*b*) Common roads and streets.—Provision made for them in settling up land; the traffic for which they are suited, and the cost of hauling it over different surfaces; the materials used in their construction, and the merits and cost of the various systems.

(*c*) Canals and rivers.—The Canadian canal system, the methods and costs of construction and maintenance, the traffic it is designed to carry, and the cost of transportation.



Thermodynamic Laboratory.



An Engineering Testing Laboratory.

(*d*) Steam railroads.—The traffic they serve and the cost of handling it, the details of location and the influence of physical features and trade possibilities upon it, the cost and design of construction, the duties of the engineer upon such work, the appliances at present in use for safe and speedy handling of trains.

(*e*) Electric roads.—The traffic which they now carry, their location and construction, the reasons for their rapid extension, and their probable future.

The questions of the development and applying of motive power and the various appliances, mechanical and electrical, now in use for these special purposes are taken up in special descriptive lectures in the mechanical and electrical departments.

15. THERMODYNAMICS.

Lecturer:—R. J. Durley, B.Sc., Ma.E., A.M.Inst.C.E.

Demonstrator:—H. M. Jaquays, M.A., M.Sc., A.M.Can.Soc.C.E:

The course in this subject extends over the Third and Fourth Years, and includes the following:—

Third Year—(Monday, 11.)

Fundamental laws and equations of Thermodynamics; their application to gases and to vapours, saturated and superheated. Efficiency of perfect heat engines. Properties of steam, and elementary theory of the steam engine. Elementary theory of gas and hot air engines.

Fourth Year—(Monday, 12; Thursday, 11.)

Theory of reversed heat engines and refrigerating machines. Entropy and Entropy-Temperature diagrams. A thermodynamic study of the steam engine, including the behaviour of steam in the cylinder. Economy of steam engines. Influence of size, speed, and rate of expansion. Compound expansion. The steam jacket. The testing of steam engines. More advanced theory of gas, air, and oil engines.

The advanced course is carried out as far as possible in connection with the experimental work of the Thermodynamic Laboratory.

Text-books.—Ewing's Steam Engine (Cambridge Univ. Press); Peabody's Tables of Properties of Steam (Wiley).

16. SUMMER CLASSES IN ART.

Freehand Drawing.

Elementary Course.—Studies in pencil and charcoal preparatory to outdoor sketching. Plant life. Landscape in pencil.

Advanced Course.—Animals and the human figure from casts. Studies in drapery. Studies from the living model. Figure composition.

Modelling.

Elementary Course.—Ornament, low relief, and high relief. Casting in plaster of Paris..

Advanced Course.—Animals in relief and in the round. Drapery. The human head and figure from casts in relief and in the round. The human head and figure from life, with sculpture composition.

Painting (Oils and Water Colour).

Elementary Course.—Studies in still life (objects, fruits, plants, etc.). Indoor studies in landscape as preliminary to outdoor work from Nature. Outdoor sketching.

Advanced Course.—The human head and figure from the living model. Drapery. Figure and colour composition.

The work will extend over the months of May and June, commencing May 1st. Hours of attendance, 10 to 1, and 2 to 5, daily, except Saturdays, 9 to 1.

Students may pursue their studies in one or more subjects continuously every day under constant teaching and criticism.

Excursions for outdoor sketching will be arranged for suitable days during the session.

Drawing, modelling, painting from the living model will be undertaken should a sufficient number of qualified students desire it.

Information as to fees, etc., may be obtained on application.

17. SPECIAL LECTURES.

During session 1899-1900, the following special lectures were delivered under the auspices of the Applied Science Society:—

M. J. Butler, M.Can.Soc.C.E., on "Essential qualifications for a successful career in the engineering profession."

F. W. Draper, B.Sc., on "The lead and zinc field of South Western Missouri.'"

G. R. Duncan, on "The thermal conductivity of the metals."

S. F. Kirkpatrick, B.Sc., on "Mining in Cape Breton."

G. R. MacLeod, B.Sc., on "Canadian Canals."

Walter B. Snow (Boston), on "Mechanical Ventilation."

F. W. White, B.A.Sc., on "Mechanical Refrigeration."

Also, R. D. Mershon (Westinghouse Company, Philadelphia), gave a lecture to the students of the Electrical Department on "The losses in electric transmission lines at high voltage."

E. Rutherford, B.Sc., a special course of lectures to advanced and graduate students on "electric oscillations."

§ XII. LABORATORIES.

In the Laboratories the Student will be instructed in the art of conducting experiments, a sound knowledge of which is daily becoming of increasing importance in professional work.

1. ASSAYING LABORATORY. See MINING and METALLURGICAL LABORATORIES.

2. ASTRONOMICAL OBSERVATORY. See GEODETIC LABORATORY.

3. CEMENT LABORATORY.—The importance of tests of the strength of mortars and cements is very great. The equipment of the Laboratory for the purpose is on a complete plan, including:—

(*a*) Three one-ton tensile testing machines, representing the best English and American practice.

(*b*) One 50-ton hydraulic compressive testing machine.

(*c*) Volumenometers for determining specific gravity and for determining the carbonic acid in the raw material.

(*d*) Faija steaming apparatus for blowing tests.

(*e*) Mechanical hand and power mixers.

(*f*) Apparatus for determining standard consistency.

(*g*) Vicats' and Gilmore's needles for determining set.

(*h*) Weighing hopper, spring and other balances.

(*i*) Gun metal moulds for tension, compression and transverse test pieces, and special moulds for placing mortar into the moulds under a uniform pressure, which, together with the mechanical mixers, enable the personal error to be eliminated.

(*j*) Sieves of 20, 30, 40, 50, 60, 70, 80, 100, 120 and 180 meshes per lineal inch for determining the fineness.

The laboratory is also fitted with copper-lined cisterns, in which the briquettes may be submerged for any required time, and with capacious slated operating tables, bins and tin boxes for keeping the cement dry for any period.

In the Cement Testing Laboratory, researches have been made on the strength of mortars set under pressure, the effect of frost on natural and Portland cements, the effect of sugar on lime and cement

mortars, the strength of lime and cement mortars and of the bricks in brick piers, the effect of fine grinding on the adhesve strength of cements, of using hot water in mixing mortars. Continued tests on the strength of concrete blocks in series are made by Fourth Year Students.

In addition, to these researches, a large amount of work is done each year by the Third Year students, in investigating the specific gravity, fineness, setting properties, constancy of voume, and the tensile, comprehensive and transverse strengths of cement, both neat and with the sand.

4. Chemical Laboratories.—The main lecture theatre, extending through two storeys, is entered from the ground floor, and seats nearly 250 students. The lecture-table is supplied with coal-gas, oxygen and hydrogen, electricity, water, vacuum, down-draught, etc., and can be well seen from all parts of the room.

Besides the main lecture theatre there are three smaller class-rooms, accommodating from 40 to 60 students each.

The three principal laboratories have each a floor-space of about 2,400 square feet, and together have accommodation for nearly two hundred students working at a time. They are lighted on three sides, and have ample hood space. One is intended for beginners, and the others for more advanced work, particularly in qualitative and quantitative analysis. In connection with each of the main laboratories is a balance-room, equipped with balances by several of the best makers.

Physical Chemistry is provided for in a special laboratory, nearly 30 by 40 feet, lighted from the north, and supplied with electricity, steam, vacuum pumps, etc. The equipment of this department consists of the apparatus necessary for the determination of the specific gravities of solutions, of the depression of freezing point, and the rise of boiling point, of the densities of gases and vapours. There are constant-temperature baths for accurate measurement of solubilities, Kohlrausch's apparatus for determining the electrical conductvity of solutions, and the apparatus necessary for measuring the electromotive forces generated between metals and their solutions, and in voltaic cells generally. There are also calorimeters

Macdonald Chemistry Building.—A Research Laboratory.

Macdonald Mining Building.—The Assay Room.

for measuring the heat effects produced in chemical reactions. There is on the same floor an optical room furnished with refractometers for measuring the refractive indices of solutions, goniometers, polariscopes and spectroscopes. Other forms of apparatus will be added as required for research work.

Immediately adjoining the laboratory of Physical Chemistry is the Photographic department, supplied with two dark rooms, arranged on the maze system, and supplied with the necessary appliances for all ordinary photographic work, including an enlarging camera. Apparatus for micro-photography will shortly be added to the equipment.

The laboratory for gas analysis has a northern exposure, and is fitted with a large tank to contain water at the temperature of the room, for use in obtaining a constant temperature in the measurement of gases. The tables are arranged for work with mercury, and the laboratory is supplied with the apparatus of Hempel, Dittmar, Orsat, Elliot, and others. It contains also Fleuss, Boltwood, and Töpler pumps for producing high vacua.

The laboratory for electrolytic analysis is supplied with accumulators, thermopile, platinum electrodes, rheostats, ammeters, volt-meters, etc.

Another room is shortly to be equipped with electric furnaces and other appliances for electro-chemical work.

The organic department comprises a laboratory for preparations and research, a combustion room for analysis, a dark room for polariscope and saccharimeter work, and a lecture room. The laboratory is fitted with all the necessary apparatus for organic research—special hoods for work with poisonous gases, regulating ovens for digesting and drying at various temperatures, filter presses for the extraction of raw materials, and various forms of apparatus for distillation in vacuo. The dark room is equipped with polariscopes and saccharimeters for sugar work. And there is a large supply of the necessary organic chemicals, which are supplied free of charge to students engaged in routine or research work in this department.

The laboratory for determinative mineralogy has places for 28 students, and is supplied with abundant material for practical work. It adjoins the lecture-room, in which the lectures in advanced mineralogy are delivered. The mineralogical department is also provided with suitable machinery, run by electricity, for use in the cutting and polishing of minerals and rocks.

The Library contains a valuable collection of the most recent English, French, and German books, and sets of various journals and transactions, including the Berichte der Deutschen Chemischen Gesellschaft, Journal fûr praktische Chemie, Chemisches Central-blatt, Fresenius' Zeitschrift fûr Analytische Chemie, Annales de Chemie et de Physique, Journal of the Chemical Society, Chemical News, Mineralogical Magazine, Mineralogische und Petrographisiche Mittheilungen, etc. The library is open to students under such restrictions as are necessary to prevent damage or loss of books.

The rooms for allied purposes have, as far as possible, been grouped together on the same floor, and there is a hydraulic lift running from the basement to the attic. The offices and principal laboratories and supply rooms are also connected by a system of telephones. The building is practically fire-proof.

5. Electrical Laboratories.—The re-equipment of these Laboratories has been completed during the past year and they now contain all principal types of commutating, synchronous, and induction machinery, together with ample facilities for investigating their action. The several Laboratories are the Standardizing Laboratory, the Dynamo Laboratory, the High Tension Testing Room, the Photometer Room, and the Laboratory for special investigation.

(*a*) The Standardizing Laboratory is equipped with four Kelvin Balances for alternating and direct current measurements, best range .025 to 600 amperes; a Kelvin standard electrostatic multicellular voltmeter, Board of Trade pattern; a Western laboratory standard Ammeter, range with shunts 0-1500 amperes; a Western Laboratory standard Voltmeter range with multipliers, 0.3000 volts.; special Weston alternat-

ing current voltmeters and wattmeters; a special Elliott Potentiometer with standard cells for electromotive force and current measurement; means for measuring high and low resistances, capacity, and di-electric strength of insulating materials, etc., etc. Direct current for the Laboratory is furnished either direct from the service plant, from a special motor-dynamo, the voltage of which can be continuously varied from 0 to 10 volts., current capacity 300 amperes; from a 75 K.W. hour storage battery arranged in sections, or from any machine in the Dynamo Laboratory. Alternating current of several wave shapes and frequencies up to 150 periods per second, and voltages up to 200,000, is available. A special transformer having a current capacity of 800 amperes is used for alternating current ammeter calibration. For alternating current voltmeter calibration, a special regulator is provided, by which voltages from 0 to 200 can be obtained in as small steps as desired.

(*b*) The Dynamo Laboratory. This Laboratory consists of two sections, one devoted to direct current work, and the other to alternating current work. The former method of driving all dynamos from an overhead line shaft and clutch pulleys has been abandoned and individual motors supplied for each machine. Each motor is provided with suitable series turns and variable shunt, the whole being connected to act with or against the shunt turns, as a compounding or differential effect is desired. The speed of the motors can be varied about 50 per cent. by field rheostat. This gives perfect control of dynamo speed. Current for operating is obtained from six independent sources of supply; one 75 K. W. direct connected unit in the service plant; 3 sets of 25 K. W. hour chloride accumulators and two city supply circuits. All dynamos and motors are mounted on strong testing benches fifteen inches high, with slotted floor, so that any machine can be placed anywhere on the benches and secured in place. Two small travelling cranes over the benches allow machines to be easily shifted. All wiring is done in conduits under the floor, and large sectional switchboards are pro-

vided for current distribution about the laboratories. Special testing tables, permanently wired up and fitted with circuit breakers, switches, etc., facilitate the work. Twenty-five commutating machines, generators, motors, boosters, motor-generators, dynamotors, converters, closed and open coil arc machines, varying in capacity from a fraction of a kilowatt to 75 kilowatts, of many different types and makes, are provided for direct current testing. Twelve alternating current machines, including generators, synchronous motors, compensators, and synchronous converters, together with a large amount of stationery and rotary induction apparatus, are provided for alternating current work. Several of the alternating current dynamos are of the inductor type and several different shaped inductors are provided with each machine to give different wave forms. A specially arranged induction motor serves as a frequency changer. The laboratory is also provided with between eighty and ninety voltmeters, ammeters, and wattmeters of standard make and of different ranges; condensers, rheostats, standard resistances, etc.

(*c*) High Tension Testing Room. This room is equipped with four 10 K.W., 200-50,000 volt. transformers with switch board and suitable controlling devices. The voltage can be varied in small steps by means of a Stillwell regulator inserted in the primary and by varying the field of the dynamo supplying current. A Kelvin direct reading electrostatic voltmeter, range 100-100,000 volts., gives a means of measuring high voltages directly.

(*d*) The Photometer Room. This room is equipped with standard photometric apparatus for candle power measurements on arc and incandescent lamps.

(*e*) The Laboratory for special investigation adjoins the Standardizing Laboratory. Meter and transformer testing are also done in this room.

6. Geodetic Laboratory.—The equipment of this laboratory consists of:—

(1) Linear instruments.

(*a*) A Rogers comparator and standard bar for investigating standards of length.

(*b*) A fifty-foot standard and comparator for standardizing steel bands, chains, tapes, rods, etc.
(*c*) A Whitworth end-measuring machine and set of standards.
(*d*) A Munro-Rogers linear dividing engine.

(2) Circular instruments.

(*a*) A Rogers' circular comparator and dividing engine.
(*b*) Two level triers.

(3) Time.

(*a*) An astronomical clock and clock circuit in connection with the observatory clocks.
(*b*) Chronometers running on mean and sidereal time.
(*c*) Chronograph.

(4) Gravity.—A portable Bessel's reversible pendulum apparatus, with special pendulum clock and telescopic apparatus for observing coincidences of beats.

(5) A water gauge apparatus for testing aneroid barometers.

(6) Magnetic instruments:—

(*a*) A Kew dip circle.
(*b*) A Kew filar magnetometer.

The laboratory is constructed with double walls and enclosed air spaces, and has a special heating apparatus, so that the temperature within may be brought to, and held at, any desired degree.

The ordinary course of instruction in this laboratory is described in § XI., Art. 14.

Astronomical Observatory.—The observatory equipment for the purpose of instruction in practical astronomy consists of:—

1. A Bamberg prismatic transit with zenith attachment.
2. Two astronomical transits for meridian observations. Collimating telescopes.
3. A. Troughton & Sims' zenith telescope.
4. An astronomical transit in the prime vertical.
5. Sidereal and mean time clocks and chronometers.
6. Chronograph and electrical circuits by which observations and clock comparisons within or without the observatory may be made.

7. Hydraulic Laboratory.—Here the student will study practically the flow of water through orifices of various forms and sizes, through submerged openings, over weirs, through pipes, mouth-pieces, etc.

The equipment of this laboratory includes:—

(*a*) A large Experimental Tank, 30 ft. in height and 25 sq. ft. in sectional area. With this tank experiments are conducted on the flow of water through orifices either free or submerged. By a simple arrangement the orifices can be rapidly interchanged without lowering the head, and with the loss of only about one pint of water. The indicating and measuring arrangements connected with the tank are exceedingly delicate and accurate, all times being automatically recorded by an electric chronograph, and valuable results have already been obtained. By means of a special connection with the city water-supply, the available head of water may be increased up to 280 ft.

(*b*) An Impact Machine, which renders it possible to measure the force with which water flowing through an orifice, nozzle, or pipe, strikes any given surface, and also the impulsive effect of the water entering the buckets of hydraulic motors.

(*c*) A Rife's Hydraulic Ram.

(*d*) A Jet Measurer specially designed for investigating the dimensions of the jet produced in the phenomena known as "the inversion of the vein." With this apparatus it is possible to determine, within .001 inch, the dimensions of a jet in any plane and at any point of the path.

(*e*) Numerous orifices, nozzles, and mouth-pieces.

(*f*) A specially designed stand-pipe, with all the necessary connections for pipes of various sizes for investigations on frictional resistance. The pressures are measured by recording gauges, etc.

(*g*) A flume about 35 feet in length, by 5 ft. in width by 3 ft. 6 ins. in depth.

(*h*) Weirs up to 5 ft. in width, and with a depth of water

over the sill varying from nil to 8 inches. A weir-depthing machine, with three adjustable heads, gives the surface depth of the stream at any three points in a transverse section. The velocity of the stream is also determined by means of a double Pitôt tube.

(*i*) Numerous hydraulic pressure-gauges.

(*j*) A mercury column 60 feet in height.

(*k*) Gauge-testing apparatus.

(*l*) Various rotary, and piston meters, and a Venturi meter.

(*m*) Apparatus for illustrating vortex motion.

(*n*) Apparatus for illustrating vortex ring motion, and for determining the critical velocity of water flowing through pipes.

(*o*) Five specially built gauging tanks with suitable indicators, each having a capacity of 800 cubic feet. Also other portable tanks.

(*p*) Transmission and absorption dynamometers.

(*q*) An experimental centrifugal pump, which can be tested with varying heights of suction and discharge.

(*r*) An inward-flow turbine, a new American turbine, a Pelton, and other motors and turbines.

(*s*) Standard gallon and litre measures with glass strikes. This Laboratory is also provided with a set of pumps, specially designed for experimental work and research. They are adapted to work under all pressures up to 120 lbs. per sq. in., and at all speeds up to the highest found practicable. The set is composed of three vertical single acting plunger pumps of 7 in. diam., 18 in. stroke, driven from one shaft. They have two interchangeable valve chests, and it is arranged that both the valves and their seats may be removed and replaced by others. The pumps are also provided with a double set of continuous recording indicators designed in the laboratory and having electrical connections. With these, an accurate record of the suction and discharge valves may be obtained at any given time, all fluctuations of speed, pressure, etc., being automatically recorded.

8. Mathematics and Dynamics, Laboratory of.—The

equipment of this Laboratory includes instruments for the measurement of distance (scales, micrometers, cathetometer), of area (planimeters), of volume (flasks, graduated vessels, etc.), of time (clocks, chronographs), of mass (beam and spring balances); it is also provided with a mechanical integrator, specific gravity balances, Atwood and Morin machines for experiments on the Laws of Motion, inclined planes, a variety of rotation apparatus (gyroscope, Maxwell's dynamical top, torsion balance, pendulums, etc.), air-pumps, thermometers, barometers, etc.

The Mathematical Laboratory is used chiefly in connection with the course in Dynamics. Lectures are given on the fundamental and derived units of the Science, as well as on the Laws of Motion, and deduction from the same. When the students have in this way been made acquainted with some of the ideas of the subject, they are admitted to the laboratory, where experiments of a progressive character are assigned to them. These experiments are in all cases quantitative, and embrace the measurement of mass by means of accurate physical balances, of intervals of time by clock and chronograph, and of distance by means of scales, screw micrometers, etc. They then proceed to the measurement of areas, volumes, velocities, accelerations, forces, specific gravities, friction, and also to pendulum experiments, etc. The equipment of the laboratory for this work is very complete, embracing as it does the ordinary instruments for the purpose to be found in most physical laboratories, together with a variety of apparatus specially constructed for this laboratory. Particular attention is given in the lectures to the principles of observing in general, the sources of error, etc.; the whole course having reference to the subsequent work of the student in the Physical and Engineering Laboratories.

9. Mechanical Laboratory.—In this Laboratory experiments are carried out on the efficiency of belts and shafting, and on the action and efficiency of cutting tools. A complete set of apparatus is provided and fitted up for the testing of lubricants, and a hydraulic and a belt transmission dynamometer are available for measuring the efficiency of machines. A belt testing machine is at present under construction in the College workshops.

Much valuable apparatus has been added to this laboratory since

the opening of the Buildings, all of which has been made in the mechanical workshops, and mainly by students. The Thurston oil tester and the Bunte's viscosimeter, which formed the original equipment, have been supplemented by a hydraulic dynamometer for testing the efficiency of machines, a rotary transmission dynamometer on a new principle, with recording attachment, a pneumatic gauge for measuring delicate pressures down to the 3,000th of a lb. per square inch, two other draft gauges, a belt transmission dynamometer, a belt-testing, and other apparatus.

With these instruments, and with the machines and other appliances in the workshops, experiments are carried on during the winter session, and students sometimes carry out researches during the summer months.

Many visits have also been paid to engineering works and manufactories of importance.

10. MINING AND METALLURGICAL LARORATORIES.—The Macdonald Chemistry and Mining Building was completed in 1898, and the Mining and Metallurgical Laboratories, situated in the lower part of the structure, are now fully equipped.

These laboratories, with the lecture rooms, the professor's offices, and rooms for apparatus, supplies and fuel, are very conveniently arranged individually and with regard to one another, and occupy the lower part of the main building and the whole of both wings. The total floor space covered is approximately 17,000 square feet, divided as follows:—

Mining and Ore-Dressing Laboratory, or Milling Room, 4,000 square feet; Metallurgical Laboratory, or Furnace Room, 3,500 square feet; Assay Laboratory, 2,500 square feet; Wet Assaying Rooms, 500 square feet; Technical Lecture Rooom, 750 square feet; Library and Drawing Room, 750 square feet; Special laboratories, Offices, Stores, and so forth, 5,000 square feet.

The two rooms first mentioned are of great size, and are the chief laboratories of the department. In these it is possible to take any ores of gold, silver, copper, or lead in the condition in which they come from the mines, and to treat them from beginning to end, precisely as they are treated in the ore-dressing works and smelting plants of the mineral regions. They may therefore be considered as constituting a small working plant for the actual production of metals. They differ from commercial plants, however, in that an ordinary ore-dressing establishment is designed to treat the ores of only one

district, and sometimes of only one part of a district. The University Laboratories must of course be adapted to all ores now found or likely to be found in the Dominion, and therefore contain a greater number of pieces of apparatus than are to be found in any one commercial establishment, although probably no case will come up when all of these machines will be used for any one test.

THE MILLING-ROOM is equipped with a complete working plant, capable of treating, if necessary, 10 to 20 tons of ore per day, the chief pieces of apparatus being:—Rock Crushers of three kinds, Blake, Dodge and Comet, to break the large pieces of ore to small size; Stamp mills of 60 to 950 lbs., respectively, for the fine crushing and amalgamating of gold ores; Huntingdon mill, for crushing and amalgamating; rolls, both coarse and fine, to reduce ores to powder when necessary; trommels and sieves for sizing the crushed ores; adjustable Hartz, Collom and slide jigs, with 2 and 4 compartments, for concentrating minerals by gravity; revolving, bumping, and belt tables; Frue vanner, Wilfley table, etc., for separating valuable minerals contained in fine sands and crushed rock; plates, pans, and barrels for amalgamating gold and silver ores; spitzkasten, spitzlütten, magnetic separators, coal washers, dolly tubs, and various other special pieces of ore-dressing apparatus.

The machinery above mentioned is not in miniature; it is of full size, such as the graduates will afterwards find in use in working establishments. It is, however, so arranged that each piece can be worked by itself, and taken apart and cleaned up; and such of the larger pieces as cannot be used for small quantities of material are duplicated in miniature by working models for handling small lots of material. An hydraulic lift and a complete series of belt and bucket elevators, samples, etc., are provided for use in heavy, continuous work. The laboratory, while thus adapted to illustrate work on a comparatively large scale, is even more perfectly designed for experimental work on as small a scale as is compatible with accuracy of result. The motive power used is electricity, generated in the University power and light station, and utilized through a number of electric motors conveniently placed near the machines to be operated. The department is equipped with the most approved apparatus for electrical measurements, and is thus able to make constant and accurate determinations of the amount of power used by each machine, and for any especial condition of use.

THE METALLURGICAL LABORATORY is fitted with a water-jacket blast-furnace, 24 ins. inside diameter, with the necessary blast apparatus for smelting lead and copper; also with a hand reverberatory furnace, a Bruckner roasting furnace, an English cupellation-furnace, and several crucible furnaces.

It has also a lead-lined chlorination barrel for high pressures, with filter press, air pump, etc., and several small vats, barrels, etc., for the chlorination and leaching of silver and other ores, also both large and small cyanide extraction plants for gold ores.

In addition to the above, the laboratory has a specially designed low voltage motor dynamo for electro-metallurgical work, with the necessary accompaniment of tanks, vats and a good storage battery. It also has an electric furnace of considerable power and of wide range of adaptability.

The two main laboratories are very large and well lighted, and are each 20 ft. high in the clear. Close to them are the rooms for storage of ores, fuel, etc., etc., from which clear level passages lead to the elevators and connect with the crushers and furnaces. There are also several overhead hoists and travellers, and a large number of truck wagons and portable tanks for carrying wet, dry, or molten material from place to place. Material can, therefore, be moved from one point to another with the greatest ease, and pieces of apparatus can be readily taken apart, and, if necessary, moved by the same means.

It is not the purpose of the University to use these laboratories for commercial work, although they are quite large enough for such service. They are to be used solely for educational work and for investigation; and, owing to their thoroughly practical nature, instruction given is of immensely greater value to the students than could be the case if the work were done only in miniature. At the same time, the investigations made by means of such are of greater use to the mining and metallurgical community, as they are carried out in all respects under working conditions, and are therefore free from the disturbing causes likely to interfere with attempts to reproduce commercial processes on a small scale.

The Assaying Laboratory is equipped with a large soft coal assay furnace, and with a complete set of small muffle and crucible furnaces, some of each being arranged for gas and gasoline, and others for coke and charcoal. Connected with this are smaller rooms, one provided with pulp, bullion and assay balances, and others for parting and the other chemical work involved in the main operations.

In other rooms of the department there has recently been installed some very excellent apparatus for metallurgical research, including some admirable electric pyrometers of both the Le Chatellier and Callendar type; a powerful hydraulic press for subjecting metal to extreme stress for long periods of time; and a very complete microscope and photo-microscope equipment. There is also a calorimeter-room with Mahler and other instruments, and a well-fitted analytic laboratory.

The courses of instruction in these laboratories are described in §XI, 13.

11. Petrographical Laboratory.—The Petrographical Laboratory, containing the chief rock collections of the University, is situated in the Chemistry and Mining building. It is arranged for the use of Students in the Mining Course as well as for those desiring to take advanced work, and is provided with a number of petrographical microscopes by Seibert, Crouch, and Fuess, as well as with models, sets of thin sections, electro-magnets, heavy solutions, etc., for petrographical work.

A collection of typical rocks has been especially prepared for the use of students, and a complete equipment for cutting, grinding, and polishing rocks, has been installed, which runs by electric-power and gives excellent facilities for the preparation of thin sections for microscopic use.

For advanced work and petrographical investigation Dr. Adams' extensive private collection of rocks and thin sections is available for purposes of study and comparison.

12. Physical Laboratory.—The equipment of the Macdonald Laboratories comprises: (1) apparatus for illustrating lectures; (2) simple forms of the principal instruments for use by the students in practical work; (3) the most recent types of all the important instruments for exact measurement, to be used in connection with special work and research.

The basement contains the cellars, furnaces, and janitor's department at the west end of the building. The machine room—containing a small gas engine and dynamo, which are fitted for testing, but can also be used for light and power, a motor-alternator and a motor-dynamo—is situated at the extreme western corner of the basement so as to be as far removed as possible from the delicate magnetic and electrical instruments. Here is also the switch-board for controlling the various circuits for supplying direct or alternating current to different parts of the building. The Accumulator Room contains a few large storage cells, charged by the motor-dynamo, which are fitted with a suitable series-parallel arrangement, and with rheostats for obtaining and controlling large currents up to 4,000 amperes for testing ammeters and low resistances, etc.

Mathematical Laboratory.

Petrographical Laboratory.

The Magnetic Laboratory contains magnetic instruments and variometers of different patterns, and also a duplicate of the B. A. Electro-dynamometer, which has been completely remodelled and set up with great care for absolute measurement of current. The Laboratory, on the opposite side of the basement, contains a very fine Lorenz apparatus for the absolute measurement of resistance, constructed under the supervision of Prof. Viriamu Jones. It also contains a set of Ewing Seismographs and a pair of Darwin Recording Mirrors for measuring small movements of the soil.

There is a constant Temperature Room, surrounded by double walls, which contains a Standard Rieffler Clock, and is fitted for comparator work.

The Ground Floor contains at the western corner a small machine shop, fitted with a milling machine and suitable lathes and tools driven by electric motors, and such appliances as are required for the making and repairing of the instruments, for which the services of a mechanical assistant are retained. There is also a store room for glass, chemicals, and cleaning materials, and extensive lockers and lavatories for the use of the students.

The Main Electrical Laboratory is a room 60 feet by 40, and is fitted with a number of brick piers, which come up through the floor, and rest on independent foundations, in addition to the usual slate shelves round the walls. This room contains a large number of electrometers, galvanometers, potentiometers and other testing instruments of various patterns, and adapted for different uses. It connects with a smaller room at the side, in which are kept the resistance boxes and standards, and also the capacity standards. A small research laboratory adjoining the electrical laboratory, is fitted up for the study of electrical discharge in high vacua, and for work with Röntgen and uranium radiation, and with ultra-violet light.

The First Floor contains the Main Lecture Theatre, with seats for about 250 students. The lecture table is supported on separate piers, which are independent of the floor. Complete arrangements are provided for optical projection and illustration. The Preparation Room in the rear contains many of the larger pieces of lecture apparatus, but the majority of the instruments, when not in use, are kept in suitable cases in the adjoining apparatus room. On the same floor there is the Heat Laboratory, devoted to advanced work in Thermometry, Pyrometry and Calorimetry, and also to such electrical work as involves the use of thermostats and the measurement of the effects of temperature. There are also two smaller rooms for Professors and Demonstrators.

The Second Floor is partly occupied by the upper half of the Lecture Theatre. There is also an Examination Room for paper work,

a Mathematical Lecture Room, with a special apparatus room devoted to apparatus for illustrating Mathematical Physics, and a special Physical Library chiefly devoted to reference books and periodicals relating to Physics. A store room, lavatories, and Professors' room occupy the remainder of the flat.

The Third Floor contains the Elementary Laboratory, a room 60 feet square, devoted to elementary practical work in Heat, Sound, and Electricity and Magnetism. There is a Demonstrator's Room adjoining, and an optical annex devoted to experiments with lenses, galvanometers and polarimeters. Also a series of smaller optical rooms, including a photometric room, specially fitted for Arc photometry, and a dark room for photographic work. Communication between the different flats is facilitated by means of a hydraulic elevator. The building is lighted throughout by electricity, and heated by hot water. The walls are of pressed brick, and the floors of hard maple. There is a ventilating system, consisting of Tobin tubes and suitable exit flues, assisted by a fan in the roof.

13. Testing Laboratories.—The principal experiments carried out in these will relate to the elasticity and strength of materials, friction, the theory of structures, the accuracy of springs, gauges, dynamometers, etc. The equipment of this laboratory includes:—

(*a*) A Wicksteed 100-ton and an Emery 75-ton machine for testing the tensile, compressive and transverse strength of the several materials of construction. To the former has been added a specially designed arrangement, by which the transverse strength of girders and beams up to 26 ft. in length can be determined. These machines are provided with the holders required for the various kinds of tests, and new holders have also been specially designed and made in the laboratory for investigating the tensile and shearing strength of timber for wire rope and belt tests, etc. Numerous attachments have also been made to the machines, which have already increased their efficiency. The most recent addition is a double-bearing support for transverse testing.

(*b*) An Impact Machine, with a drop of 30 ft., and with gearing which will enable speciments to be rotated at any required speed, and the blows to be repeated at any required intervals. By means of a revolving drum, a continuous and

accurate record of the deflections of the specimens under the blows can be obtained.

(*c*) An Unwin Torsion Machine with a specially designed angle-measurer, by which the amount of the torsion can be measured with extreme accuracy.

(*d*) An Accumulator, furnishing a pressure of 3,600 lbs. per square inch, which is transmitted to the several testing machines, and ensures a perfectly steady application of stress, an impossibility when any form of pump is substituted for an Accmulator.

(*e*) A Blake and a Worthington Steam Pump, designed to work against a pressure of 3,600 lbs. per square inch. The Accumulator may be actuated by either of the pumps, and, if at any time it is desirable to do so, either of the pumps may be employed to actuate the testing machine direct. When in operation the work of the pump and the accumulator is automatic.

(*f*) Extensometers of the Ewing, Unwin, Martens, Marshall and other types. The extensometer equipment has recently been enriched by seven sets of improved extensometer apparatus designed and made in the laboratory.

(*g*) Portable cathetometers, and also a large cathetometer specially designed and constructed for the determination of the extensions, compressions and deflections of the specimens under stress in the testing machines.

(*h*) An automatic electric motor pump for actuating the Accumulator; also various electric motors for working the several machines.

(*i*) A drying oven for beams up to 26 ft. in length. The hot air in this oven is kept in circulation by means of a fan driven by an electric motor.

(*j*) Numerous gauges, amongst which may be specially noticed an Emery Pressure Gauge, graduated in single lbs. up to 2,500 lbs. per square inch. All of the testing machines are on the same pressure circuit, and are connected with the Emery gauge and also other standard gauges, including recording gauges. This arrangement provides a prac-

tically perfect means of checking the accuracy of the testing.

(*k*) Special apparatus and recording gauge for the testing of hose, etc.

(*l*) Dynamometers for measuring the strength of textile fabrics, the holding power of nails, etc.

(*m*) Apparatus for determining the elasticity of long wires.

(*n*) Apparatus for determining the hardness of materials of construction.

(*o*) Zeiss and other Microscopes.

(*p*) Delicate chemical and other Balances. A very important part of the equipment is the Oertling Balance, capable of indicating with extreme accuracy weights of from .00001 lb. up to 125 lbs.

(*q*) Micrometers of all kinds.

14. THERMODYNAMIC LABORATORY.—The Thermodynamic Laboratory is furnished with an experimental steam engine of 120 I. H. P., specially designed for investigating the behaviors of steam under various conditions; the cylinders are 6 1-2 inches, 9 inches, 13 inches, and 18 inches in diameter, and the stroke of all the pistons is 15 inches. The cylinders can be so connected as to allow of working as a single, compound, triple, or quadruple expansion engine, either condensing or non-condensing, and with any desired rate of expansion. The jackets are so fitted as to permit of measuring independently the water condensed in the cover, barrel, or bottom jacket of each cylinder, and the engine can be worked with any desired initial pressure up to 200 lbs. per square inch. The measurements of heat are made by means of large tanks, which receive the cooling water and the condensed steam. There is an independent surface condenser and air pump. Two hydraulic absorption brakes and an alternating friction brake serve to measure the mechanical power developed.

The Laboratory also contains the following machinery:—

A Robb automatic cut-off engine, having a cylinder 10 1-2 inches in diameter by 12 inches stroke. This Engine is specially fitted up for the measurement of cylinder temperatures, and can be run at speeds up to 300 revolutions per minute.

An automatic high speed engine by Macintosh & Seymour, having a cylinder 12 inches diameter by 12 1-2 inches stroke.

A hot-air engine built by Woodbury Merrill, of Ticonderoga.

An Atkinson "Cycle" Gas engine, having a cylinder 7 inches diameter by 8 inches, and indicating 7 H. P.

A "Dake" steam engine of 4 H. P.

A two stage air compressor taking 40 H. P., and having cylinders 10 inches and 17 inches in diameter, by 17 inches stroke. This compressor delivers its air into reservoirs placed beneath the floor of the machine shop, and an intercooler for use with it is now under construction.

The smaller apparatus belonging to the laboratory includes the necessary equipment of calorimeters, thermometers, gauges, pyrometers, fuel testers, indicators, planimeters, and a Moscrop recorder.

The boiler installation of the Engineering Building supplies steam for heating and power purposes, and is so arranged as to be available for experimental work in connection with the Thermodynamic Laboratory. It comprises boilers of five distinct types as follows:—

One Cornish boiler, for heating service, rated at 50 H. P.

One locomotive boiler, Belpaire type, 100 H. P.

One internally fired tubular boiler 120 H. P.

Two Babcock-Wilcox water-tube boilers, each 60 H. P.

One Yarrow water-tube boiler, fitted in a closed stokehold, for working under forced draft, rated at 150 H. P.

These boilers are provided with the necessary tanks, weighing-machines and apparatus for carrying out evaporative tests.

During the session 1899-1900, the following experimental work has been carried out in connection with the Thermodynamic Laboratory:—

A series of trials of the Atkinson "Cycle" gas engine.

A series of progressive trials of the large experimental engine, working cylinders Nos. 2 and 4 as a compound engine at various speeds, both jacketed and non-jacketed. Special

thermometric measurements of the cylinder-wall and cover-temperatures were made, the rate of expansion being kept constant throughout the series.

A series of progressive evaporative trials of the Yarrow boiler.

Preliminary tests of the air-compressor recently completed.

Economy trials of the 75 kilo-watt Robb engine and generator in the power station.

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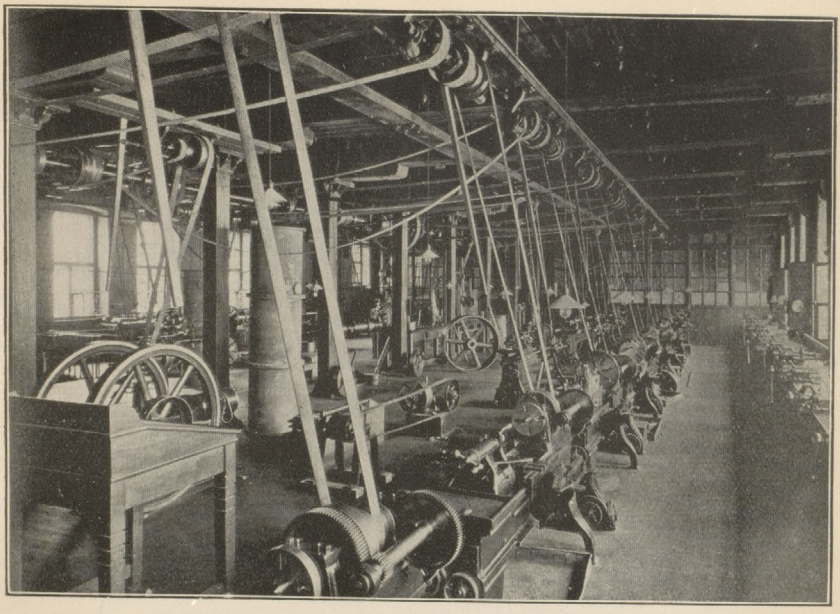
§ XIII. MUSEUMS.

THE PETER REDPATH MUSEUM.—The Peter Redpath Museum contains large and valuable collections in Botany, Zoology, Mineralogy and Geology, arranged in such a manner as to facilitate the work in these departments. Students have access to this Museum, in connection with their attendance on the classes in Arts in the subjects above named, and also by tickets which can be obtained on application.

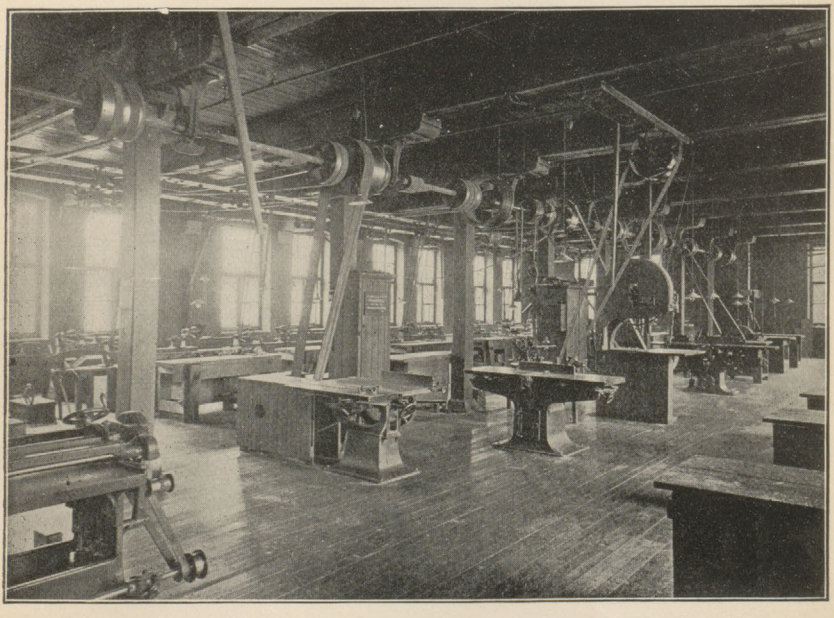
ENGINEERING MUSEUM.—This Museum occupies the third storey of the Engineering Building, and amongst other apparatus, contains the Reuleaux collection of kinematic models, presented by Sir William Macdonald, and pronounced by Professor Reuleaux to be the finest and most complete collection in America.

ARCHITECTURAL EQUIPMENT.—The Architectural Department has been endowed by Sir Wm. Macdonald, the founder, with a very thorough equipment for practical purposes of instruction; this is at present in course of provision and completion. In the Museum of the Engineering Building is included a large collection of casts both of architectural detail and ornament (illustrative of the historical development of the various styles) and of architectural and figure sculpture. The freehand-drawing classes for architectural students, as also the classes of architectural drawing and design, are conducted in this portion of the building.

A special architectural department has been added to the University Library; text-books and other works have been



Machine shop.



Pattern Shop.

added to the Faculty Library. A collection of photographs is placed in the architectural room for the use of students in the class of design, in addition to a select reference library of illustrated works. Diagrams and lantern slides are used in illustration of the historical courses; models and specimens of materials and fittings in those on Building Construction, Sanitation, etc.

XIV. WORKSHOPS.

The workshops, erected on the Thomas Workman Endowment, have a floor area of more than 25,000 sq. ft.

The practical instruction in the workshops is designed to give the Student some knowledge of the nature of the materials of construction, to familiarize him with the more important hand and machine tools, and to give him some manual skill in the use of the same. For this purpose, the Student, during a specified number of hours per week, will work in the shops under the superintendence of the Professor of Mechanical Engineering, aided by skilled mechanics. The courses commence with graded exercises, and gradually lead up to the making of joints, members of structures, frames, etc., finally concluding in the iron-working department with the manufacture of tools, parts of machines, and, if possible, with the building of complete machines.

The equipment includes the following:

In the Carpenter, Wood-Turning and Pattern-Making Departments.—Carpenters' and pattern-makers' benches, wood-lathes, a large pattern-maker's lathe, circular-saw benches, jig and band saws, buzz-planer, wood-borer, universal wood-worker, etc.

In the Machine Shop.—The most improved engine lathes, a 36-in. modern upright drill, with compound table, universal milling machine, with vertical milling attachment, hand lathes, planer universal grinding machine, universal cutter and reamer grinder, buffing machine, 1 16 in. patent shaper, vise-benches, etc.

In the Smith Shop.—Forges, hand drill, and a power hammer.

In the Foundry.—A cupola for melting iron, core oven, brass furnace, moulders' benches, etc.

The lathes and machine tools in the shops are driven by an electric motor; power is supplied for the foundry and smith-shop by a 10 H.P. high speed engine.

During the past session the following special work has been carried out in the workshops:—

A set of jacket-drain tanks, valves, and fittings, for cylinders Nos. 2 and 4 of the large experimental engine, have been constructed and fitted in place.

An oil-separating feed filter of special design, for dealing with the condensed steam returned from the heating service in the Engineering Building, has been completed and placed in position.

The air-compressor has been finished and erected, and two of the air-reservoirs have been placed in position and connected. A new duplex feed-pump for the boiler-room has been begun and is approaching completion.

A belt-testing machine of special design, capable of taking a 6 inch belt transmitting 20 H.P., is being constructed.

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§ XV. STATEMENT OF RESEARCH WORK IN THE LABORATORIES—1899-1900.

Experiments on the rate of condensation of steam, with a new form of apparatus for measuring the same.

On the "missing quantity" shown in the trials of a compound engine.

Progressive evaporative tests of a Yarrow boiler at various rates of evaporation.

Experiments on the properties of lubricants.

Experiments on the loss of power in belt-driving.

The concentration of molybdenite from occurences in quartz and other rocks.

The cyanide process as applied to certain low grade British Columbian ores.

Comparisons of the cyanide and chlorination processes on auriferous concentrates containing arsenopyrite.

Pyrometric work in connection with smelting in water-jacketed furnaces.

The Smithy.

The **Foundry.**

§ XVI. DONATIONS DURING SESSION 1899-1900.

Measuring instruments to the amount of $1,000, from a friend in New York.

5 K.W., D.C. dynamo, reactive coil, two transformers, from the Royal Electric Co.

Complete model of underground conduit system, from the American Vitrified Conduit Co., through Mr. Frank L. Packard, B.A.Sc., '97.

Drawings, photographs, etc., from the Wagner Electric Manufacturing Co.; the General Electric Co.; the Canadian General Electric Co.; the Royal Electric Co.; the Westinghouse Electric and Manufacturing Co.

Set of Tools and Drill Holders from Armstrong Bros. Engineering Company, Chicago.

Complete set of blue prints of "Mogul" locomotive from F. W. Morse, Supt. Motive Power, G.T.R.

Complete set of blue prints of various bridges from a firm of engineers in Kansas City, Mo.

Blue prints from U.S. Government.

Blue prints of locomotives from the Chicago, Burlington & Quincy Railroad Company.

Blue prints and drawings of high speed engines from the Straight-line Engine Company, Syracuse, N.Y.

One Rock Drill from the Canadian Rand Drill Company.

Set of miners' tools; 2 safety lamps; trattice cloth; maps, drawings, and photographs, from the Dominion Coal Company.

One coal section across Baltimore coal bed, and a very large collection of drawings, blue prints, and photographs, from the Lehigh Valley Coal Company.

Collection of maps, blue prints, and photographs, from the Susquehanna Coal Company.

Collection of copper, lead, gold and silver refinery products, from the Guggenheim Smelting & Refining Company.

Specimens of special armour plate nickel steel, rolled to bar for tests, from Carnegie Steel Company.

Specimens of self-hardening steel for test, and a set of hardened and ground plungers for press, from Midvale Steel Company.

Specimens of aluminum and aluminum alloys for museum and for tests, from Pittsburg Reduction Company.

Samples of gun material and Krupp steel for experiment, from Bethlehem Iron Company.

Series of fusible metals, Babbit, etc., from Aurora Metal Company.

Series of Babbit and other alloys, from Hoyt Metal Company.

Samples of smelting lead-silver ores and desilverizing and refining products, from South Chicago Works, National Lead Company.

12 tons of ore and 2 tons of slag, from Eustis Mining Company.

5 tons of ore, from Dolevah Mining Company, Cornwall, England.

Photographs and lantern slides, from Sir William Roberts-Austen, K.C.B.; Professor William Thomas; Mr. H. W. Hughes; Dr. James Douglas, and others.

Blue prints of pumps, from Messrs. Allis & Co., Milwaukee.

FACULTY OF APPLIED SCIENCE—TIME TABLE—FIRST AND SECOND YEARS.

Years	Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
First Year.	9	Mathematics.	Mathematics.	Mathematics.	Mathematics.	Mathematics.	Shopwork (*C*)
	10	Mathematics.	Mathematics.	Mathematics.	Mathematics.	Mathematics.	Do
	11		English.	Lettering.	English.	Geom. Drawing. (*a*). Lettering. (*b*).	Do
	12		Physics.	Lettering.	Physics.	Geom. Drawing (*a*.) Lettering (*b*)	Do
	2 to 5	*A*. { Math. Lab. (*a*) { Desc. Geom. (*b*) *B*. Shopwork. (S. & F.)	*A*. Physical Lab. *B*. Math. Lab. (*a*) Desc. Geom. (*b*)	Desc. Geometry.	*A*. Shopwork, (S. & F.) *B*. Physical Lab.	Freehand Drawing.	
Second Year.	9	Experimental Physics, 1, 2, 3, 4, 5, 6.	Mathematics, 1, 2, 3, 4, 5, 6.	Mathematics, 1, 2, 3, 4, 5, 6.	Mathematics, 1, 2. 3, 4, 5, 6.	Freehand Drawing, 1. Mechanism, 2, 5.	Archt. Drawing, 1. Shopwork, 3, 4, (S. & F). 2, 5. (M).
	10	Math., 1, 2, 3, 4, 5, 6.	Chemistry, 6. Surveying, 2, 5.	Mathematics, 1, 2, 3, 4, 5, 6.	Experimental Physics, 1, 2, 3, 4, 5, 6.	Freehand Drawing, 1. Surveying, 2, 5.	Do
	11	Chemical Lab., 3, 4, 5, 6. Freehand Drawing, 1. Geom. Drawing, 2.	Chemistry, 1, 2, 3, 4, 5, 6.	Chemistry, 6. Kinematics, 3, 4. Surveying, 2, 5. Elem. of Archt., 1,	Chemical Lab., 6. History of Archt., 1, 2. Kinematics, 3, 4.	Mathematics. 1, 2, 3, 4, 5, 6.	Do
	12	Chemical Lab., 3, 4, 5, 6. Drawing, 2. Freehand Drawing, 1.	History of Archt., 1, 2.	Chemistry, 1, 2, 3, 4, 5, 6.	Building Const., 1, 2. Kinematics, 3, 4.	Chemistry, 1, 2, 3, 4, 5, 6.	Do
	2 to 5	Physical Lab., 1, 2, 3, 5, 6. Mechl. Drawing, 4.	Desc. Geometry, 1, 2, 3, 4, 5, 6.	Chemical Lab., 6. Mapping, 2, 5. Shopwork, (S. & F)., 1, 3, 4.	Archt. Drawing, 1. Chemical Lab, 6. Mapping 2, Mechl. Drawing, 3, 4, 5.	Chemical Lab., 1, 2, 5, 6. Physical Laboratory, 3, 4.	

(*A*) One-half of class. (*B*) Other half of class. (*a*) First Term. (*b*) Second Term. (*c*) After Nov. 1st. 1. Architectural Students. 2. Civil Engineering Students. 3. Electrical Engineering Students. 4. Mechanical Engineering Students. 5. Mining Engineering Students. 6. Practical Chemistry Students. Shopwork:—*S*. Smithy; *F*. Foundry; *C*. Carpenter Shop; *M*. Machine Shop.

The Chemical Laboratories are open to Second, Third and Fourth Year classes daily (Saturday excepted) from 9 a.m. to 5 p.m.

FACULTY OF APPLIED SCIENCE--TIME TABLE—THIRD YEAR.

Hours.	Monday.	Tuesday.	Wedesday.	Thursday.	Friday.	Saturday.
9	Experimental Physics, 1, 2, 3, 4, 5, 6.	Art History, 1. D.C. Dyn Machy., 3. Mineralogy, 5, 6. Roads and Canals, 2.	Dyn. of Mach., 3, 4. Freehand Drawing, 1. Geology, 2, 5, 6.	D.C. Dynamo Machy, 3, Desc. Geom., 2. History of Arch't, 1. Mineralogy, 5, 6.	Freehand Drawing, 1. Machine Design, (*b*) 4. Mathematics, 2, 3, 4, 5, and 1.**	Archt. Designing (*a*) 1. Dynamo Lab. (*a*) 4. Geological Excursion, (*c*) 2,5. Mining (*d*) 5. Testing Lab. (*b*) 1, 2, 3, 4, 5.
10	Dyn. of Mach., 3, 4. Freehand Drawing, 1. Geology, 2, 5, 6.	Elem. Metallnrgy, (*a*) 4. Surveying, 1*, 2, 5.	Freehand Drawing, 1. Shopwork, (P. & M.) (*a*), 3, 4. Surveying, 2, 5. Thermo. Lab., (*b*), 3, 4.	Experimental Physics. 1, 2, 3, 4, 5.	Freehand Drawing, 1. Geology, 2, 5, 6. Shopwork (P. & M.) (*b*) 3, 4. Surveying, 1.*	Do
11	Chemistry, 6. Freehand Drawing, 1. Thermodynamics, 2, 3, 4, 5.	Theory of Structures, 1, 2, 3, 4, 5. Chemistry, (*a*) 6.	Metallurgy, (*a*), 5, 6. Shopwork, (P. & M)., (*a*) 3, 4. Surveying, 1*. Thermo. Lab., (*b*), 3, 4. Ore Dressing (*b*), 5, 6.	Chemistry, 6. Machine Design, 3, 4, 5. Roads and Canals, 2.	Freehand Drawing (*b*) 1. Graphical Statics (*a*) 1, 2, 3, 4, 5. Shopwork (P. & M.) ,(*b*) 3, 4. Thermo. Lab. (*b*) 2, 5.	Museum Work in Geology (*d*) 2, 5.
12	Math., 2, 3, 4, 5 & 1. ** Water Colouring, (*b*) 1.	Theory of Structures, 1, 2, 3, 4, 5.	Hist. of Archt., 1. Metallurgy, (*b*), 5, 6. Municipal Eng., 2. Ore-dressing, (*a*) ,5, 6. Shopwork, (P. & M)., (*a*) 3, 4. Thermo. Lab . (*b*), 3, 4	Theory of Structures, 1, 2, 3, 4, 5.	Graphical Statics (*a*) 1, 2, 3, 4, 5. Hygiene (*b*) 1. Shopwork (P. & M.), (*b*) 3, 4. Thermo. Lab. (*b*) 2, 5.	Do
2 to 5	Archt. Designing, 1. Mechl. Drawing, 3, 4, 5. Physical Lab., 2, 6.	Archt. Designing, 1. Chemical Lab., 6. Dynamo Lab., 3. Fire Assay Lab., (Jan). 5. Mapping, 2, 5.	Chem. Lab., (*a*) 5, 6. Designing, (*e*), 1. Mapping, 1, 2. Physical Lab., 3, 4. Fire Assaying, (*b*), 5, 6.	Det. Mineralogy, 5, 6. Dynamo Lab., 3. Desc. Geom. (*a*) 1, 2. Mechl. Drawing, 4. Modelling (*b*), 1. Railway Struct. (*b*) 2.	Archt. Designing 1. Chemical Lab. (*b*) 5, 6. Graphic Statics, 2. Physical Lab. (*a*) 3, 5. Shopwork, (M) 4.	

(*a*) First Term. (*b*) Second Term. (*c*) First half of first Term. (*d*) Second half of first Term. (*e*) Second half of Second Term. 1. Architectural Students. 2. Civil Engineering Students. 3. Electrical Engineering Students. 4. Mechanical Engineering Students. 5. Mining Engineering Students. 6. Practical Chemistry Students.
*3rd Year Architects with 2nd Civils. **Optional Course. (Shopwork; *M.* Machine Shop; *P.* Pattern Shop.
The Chemical Laboratories are open to Second, Third and Fourth Year Classes daily (Saturday excepted) from 9 a.m. to 5 p.m.

FACULTY OF APPLIED SCIENCE—TIME TABLE—FOURTH YEAR.

Hours.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
9	Mach. Design (*a*) 3, 4. Mining, 5. Specifications, 1. Theory of Struc., 2 &1.** Electro-Chem. Lab., (*b*) 3, 6.	Art History, 1. Dyn. of Mach , 3, 4. Mining, 5. Railway Eng., 2.	Designing, 2. Geology (*a*) 1. Metallurgy Struct. Mate. Alloys, etc , 4, 5, 6. Special Lecture, (*b*) 1. Phys.-Chem. Lab., 3 (*b*)6.	Designing, 1. Electro-Metall., (*b*) 5, 6. Hydraul. Machy.,(*b*) 5.** Hydraulics(Machy.,etc.,) 2, 3, 4. (*a*) 5.	Architecture, 1. Mechl. Eng., 4; (*a*) 2,3,5.	Dynamo Lab., (*b*) 3. Designing (*b*) 1. Geodetic Lab., 2. Geology (*a*) 1. Mining Lab., 5. Testing Lab., (*c*) 4. Shopwork, (*M.*) 4.
10	Freehand Drawing, (*b*) 1. Geology (*a*) 1. Hydraulics, 2, 3, 4, (*a*) 5. Adv. Metall. (*b*) 5, 6. Hydraulics (*b*) 5. Electro-Chemistry (*b*)3,6.	Designing, 1. Elect. Eng., 3. Petrography (*b*) 5.** Mining Adv. (*b*) 5.** Ore Deposits (*a*) 5. Thermo. Lab.. 4.	Designing, 2, 5. Dyn. of Machy., 4. Elec. Eng., 3. Freehand Drawing, 1. Metall. Gold & Silver, 5.	Designing, 1. Mechl. Eng., 4;(*a*) 3, 2, 5.	Elect. Eng. (*a*) 3. Freehand Drawing (*b*) 1. Geodesy, 2. Geology (*a*) 1. Mining, Lab., 5. Thermo., Lab., 4.	Do
11	A. C. Machy., 3. Freehand Drawing, 1. Mining & Metall. Machy 5. Electro-Chem. Lab., (*b*) 3, 6.	Designing, 1. Elect. Measurements, 3. Mining Colloq., Mining Adv. (*a*) 5.** Palaeontology, (*b*) 5.** Org. Chemistry, 6 & 1. Theory of Structures, 2 and 1 ** Thermo. Lab., 4.	A.C. Machy., 3. Designing, 2. Dyn. of Machy., 4. Freehand Drawing, 1. Mineralogy, (*a*) 5. Pract. Geology, (*b*) 5.	Dyn of Mach., 3, 4. Org. Chemistry, 6. Railway Eng., 2. Water Colouring, (*b*) 1. Thermodynamics, 3, (*a*) 4.	A.C. Machy., 3. Freehand Drawing, 1. Mining Lab. 5. Theory of Structures, 2 and 1.** Thermo., Lab., 1.	Do
12	Chemistry, 6. Freehand Drawing (*a*) 1. Geodesy, 2. Metall. Copper & Lead, 5 Thermodynamics,(*a*)3, 4. Water Colouring (*b*) 1.	Designing, 1. Physical-Chem., 3, (*b*) 6. Thermo. Lab., 4. Transportation, 5.	Mach. Des Ex. 4. Mineralogy, (*a*) 5. Municipal Eng., 2 & 1.** Geology Colloquium,(*b*) 5.	Canadian Geology, (*b*) 5. Chemistry, 6. Petrography, (*a*) 5. Dyn. of Mach., 3, 4. Water Colouring, (*b*) 1.	Electro-Chem., 6 (*b*) 3. Freehand Drawing, (*a*) 1. Hygiene,(*b*) 1. Mining Lab., 5. Theory of Struct.,2 & 1.** Thermo., Lab., 4.	Museum Work in Geology (*a*) 1.
2 to 5	Chemical Lab. 5. 6. Designing, 1, 2, 4. Dynamo Lab., 3.	Chem. Lab, 6. Designing (*a*) 1, 5. Physics, 3. Testing Lab., 2 & 1.** Thermo. Lab., 4. Petrog. Lab., 5.	Assay Lab. (*d*) 5, 6. Chemical Lab. (*b*) 5, 6. Designing, 1. Dyn. of Machy. (*c*) 4. Dynamo Lab., 3. Hydraulic Lab. (*b*) 2, 4. Metallur. Lab. (*c*), 4, 5.	Assay Lab. (*b*) 5, 6. Chem. Lab. (*b*) 5, 6. Designing, (*a*) 1. Hydraulic Lab. (*b*) 3. Modelling (*b*), 1. Physics, 4 (*a*) 3. Testing Lab., 2 & 1.	Chemical Lab., 6. Designing, 1. Dynamo Lab., (*a*) 3. Graph Statics,2 and 1.** Mining Lab., 5. Thermo. Lab., 4. Physical Lab., (*b*) 3.	

**Optional Course. (*a*) First Term. (*b*) Second Term. (*c*) First half of first Term (*d*) Second half of first Term. 1. Architectural Students. 2. Civil Engineering Students 3. Electrical Students. 4. Mechanical Engineering Students. 5. Mining Engineering Students. 6. Practical Chemistry Students.
The Chemical Laboratories are open to Second, Third and Fourth Year Classes daily (Saturday excepted) from 9 a.m. to 5 p.m.

Faculty of Law.

(Macdonald Foundation).

The Curriculum extends over three years. It includes courses of lectures upon all the branches of the Law of the Province of Quebec, and also upon Roman Law, Legal History, and the Constitutional Law of England, and of the Dominion. Its primary design is to afford a comprehensive legal education for Students who intend to practise at the Bar of the Province. In all the courses the attention of Students will be directed to the sources of the Law, and to its historical development. During their first year the students will attend a course of one hundred lectures on Roman Law, from which the Law of this Province is in great part derived. In the lectures on Legal History the relations of our Law with the Law of France and its History since the Cession will be explained. First Year Students will also attend courses on the Law of Persons; the Law of Real Estate; the Law of Obligations; and the Elementary rules of Procedure. The remaining branches of the law, civil, commercial, and criminal, will be dealt with in the second and third years. During the three years' course the Civil Code, the Criminal Code, and the Code of Civil Procedure will be covered, and lectures will also be given upon subjects, such as Bills of Exchange, Merchant Shipping, and Banking, which are regulated mainly by special statutes. A course of lectures upon Medical Jurisprudence is generally arranged for.

Students have the free use of the Law Library of the Faculty, which has lately been much enlarged. The principal reports and legal periodicals are taken. A special room for Law Students is provided in the Redpath Library. This room is open during the day, and in the evenings from eight to ten oclock.

The lectures are delivered in the rooms furnished for the Faculty in the East Wing of McGill College by its munificent benefactor, Sir Wm: C. Macdonald. The Faculty desire to impress upon English students the great importance of obtaining a familiar knowledge of French. In the practice of the profession in this Province it is almost indispensable that a lawyer shall be able to write and speak French, and to understand it when it is spoken. All who intend to become students of law are urged to pay special attention to this subject.

Those students who are able to take the B.A. course before entering upon their legal studies are strongly recommended to do so. Those for whom this is impossible are advised to attend the courses in the Faculty of Arts for two years.

Matriculation.

For particulars of the University Matriculation Examination for students in law see pp. 9-16.

The attention of students who intend to practise law in the Province of Quebec is called to the requirements of the Bar of the Province as to admission to study. These will be found on p. 211.

Scholarships and Prizes.

Various scholarships and prizes will be awarded to the students of each year who obtain the highest distinction at the Examinations in April, 1901.

No scholarship or prize will, however, be awarded to any student unless in the estimation of the Faculty a sufficiently high standing be attained to merit it.

FACULTY REGULATIONS.

1. Students of Law shall be known as of the First, Second, and Third Year, and shall be so graded by the Faculty. In each year, Students shall take the studies fixed for that year, and those only, unless by special permission of the Faculty.

2. The register of Matriculation shall be closed on the 1st of Octo-

ber in each year, and return thereof shall be immediately made by the Dean to the Registrar of the University. Candidates applying thereafter may be admitted on a special examination to be determined by the Faculty; and, if admitted, their names shall be returned in a supplementary list to the Registrar.

3. The lectures will be delivered between the hours of half-past 8 and half-past 9 in the morning, and between 4 and half-past 6 in the afternoon; and special lectures in the evening at such hours and in such order as shall be determined by the Faculty. Professors shall have the right to substitute an examination for any such lecture.

4. At the end of each College year there shall be a general examination of all the classes, under the superintendence of the Professors, and of such other examiners as may be appointed by the Corporation. The examination shall be conducted by means of printed questions, answered by the Students in writing in the presence of the Examiners. The result shall be reported as early as possible to the Faculty.

After the examinations, the Faculty shall decide the general standing of the Students.

5. At the end of the third College year there shall be a Final Examination of those Students who have completed the Curriculum. This Examination shall be conducted partly by written papers and partly orally. It shall cover all the subjects upon which lectures have been delivered during the three years' course. Those Students who satisfy the examiners shall be entitled, after making the necessary declaration and payment of the Graduation Fee to proceed to the Degree of B.C.L. The Elizabeth Torrance Gold Medal shall be awarded to the Student who shall obtain the highest marks in the Examination, provided his answers shall, in the estimation of the Faculty, be of sufficient merit to entitle him to this distinction. There shall be no Sessional Examination of Students who are candidates in the Final Examination.

6. No Student shall be considered as having kept a Session unless he shall have attended regularly all the courses of Lectures, and shall have passed the Sessional Examinations to the satisfaction of the Faculty in the classes of his year.

7. The Faculty shall have the power, upon special and sufficient cause shown, to grant a dispensation to any Student from attendance on any particular Course or Courses of Lectures, but no distinction shall in consequence be made between the Examinations of such Students and those of the Students regularly attending Lectures.

8. Every Candidate, before receiving the Degree of B.C.L., shall make and sign the following declaration:—

Ego A.B. polliceor sancteque recipio, me, pro meis viribus, studiosum fore communis hujus Universitatis boni, et operam daturum

Uuiversity Library.

ut ejus decus et dignitatem promoveam, et officiis omnibus ad Baccalaureatus in Jure Civili gradum pertinentibus fungar.

9. The fees in the Faculty will be as follows for Students matriculating after Nov., 1897:—

Matriculation or Registration Fee	$5 00
Sessional Fee by Ordinary Students (including Athletics)	53 00
Athletics Fee, payable by Partial Students	3 00
Graduation Fee	12 50
Sessional Fee by Partial Students, for the course of Roman Law, $20; for each of the courses on Successions, Criminal Law, Commercial Law, and Civil Procedure, $15; and for each one of the shorter courses	10 00
Students matriculated before Nov., 1897, will continue to pay a Sessional fee of	36 00

Matriculation and Sessional Fees must be paid on or before Oct. 1st; and, if not so paid, the Student in default shall incur a fine of $3; his name shall be removed from the books; and his attendance at lectures shall not be credited until his fees and the said fine have been paid.

COURSES IN THE FACULTY OF LAW FOR 1900-1901.

Roman Law.

Professor Walton.

During the first part the external history of the law from the early period to the codification of Justinian will be dealt with. The sources of the law will be described, and the gradual evolution explained, by which the law of the city of Rome became fitted to be the law of the civilized world. A brief sketch will be given of the legal institutions of Rome in the first period and of the early constitutional history.

In the doctrinal part of the course matters mainly of antiquarian interest will be touched only slightly. Those portions of the Roman Law which have been followed most closely in the existing law of the Province, e.g., Property, Servitudes, Pignus and Hypothec, and Obligations, will be treated in detail, and the modifications made by the modern law will be no-

ticed. Class-examinations will be held from time to time, and a first and second prize of books will be given to the two students who obtain the highest marks in these examinations.

Text-book, Moyle's or Sandar's Institutes of Justinian.

Books of reference:

Muirhead's Historical Introduction to Roman Law.
Muirhead's Institutes of Gaius.
Maynz, Cours de Droit Romain.
Puchta, Institutionen.
Girard, Manual de Droit Romain.
Maine's Ancient Law.

Constitutional and Administrative Law.

Professor Walton.

The object of this course is to explain the actual working of the Canadian Constitution. A sketch of the Constitutional History prior to Confederatio nis given. The B. N. A. Act is then explained, and the leading cases discussed which illustrate the respective powers of the Federal and of the Provincial Legislatures. The growth of Cabinet Government is traced, and some of the fundamental rules of the English Constitution are explained and contrasted with those followed in other countries.

No text-book is prescribed, but students are recommended to refer to Todd, Parliamentary Government in the British Colonies; Houston, Constitutional Documents of Canada; Dicey, Law of the Constitution; Anson, Law and Custom of the Constitution.

Legal History and Bibliography.

Professor McGoun.

This course comprises an outline of the history of the law in force in the Province of Quebec.

The main source from which this law is derived is the Customary Law of France, as modified by the principles of Ro-

man Law, embodied in several of the codes or collections of Roman Law before the time of Justinian. The Customs of France after being reduced to writing were further modified by the influence of modern Roman Law, which prevailed throughout the larger part of France. The ordinances of the French kings and the commentaries of the great jurists, from Cujas and Dumoulin down to Pothier, brought the Civil Law of France into the systematic form in which it was introduced into this Province. The custom of Paris, one of the most important of those recognized in France, became formally the basis of the Civil Law in this country, and the ordinance of 1667 was the main authority for procedure.

Since the opening of the British regime the development of Lower Canadian Civil Law has proceeded independently of the Civil Law of France, where the Code Napoléon was passed early in the Century. In Lower Canada a code on the same lines was adopted shortly before the Confederation. Lower Canadian Law has been modified by English law in commercial matters, and also by statutes passed in the Province. Criminal Law, on the other hand, has been derived almost exclusively from the Criminal Law of England.

The leading authorities upon the main branches of the law, with the reports of decisions of our courts, are brought under the attention of the students in this course.

Law of Corporations and of Joint Stock Companies.

Professor McGoun.

This course is the sequel of the course on Agency and Partnership. The doctrine of limited liability and the opportunity which it affords for carrying out enterprises of great importance, by means of capital contributed by a large number of individuals, is treated of in this course. The growth of Corporations, both those established by long custom, and those created by Royal Charter, or by Parliamentary or Legislative authority, is also explained, and the relation

between these corporations and the ordinary forms of joint stock companies Corporations sole and Corporations aggregate are defined, and the principles of laws relating to Corporations and Companies explained. In the alternate years Prof. McGoun will lecture on Agency and Partnership.

Criminal Law.

Professor Mr. Justice Davidson.

This course includes:—

A history of the Criminal Law and Criminal Procedure of England; and of their introduction into and development throughout Canada;

Discussion of the Criminal Code and other Statutes enacting criminal offences; of the rules of evidence in criminal cases, of the Fugitive Offenders' Act; of extradition, and generally of the principal features belonging to the Criminal Law of the Dominion.

Commercial Law.

Professor R. C. Smith.

The subjects dealt with will include Commercial Sales, Bills and Notes, the law of Carriers, the law of Insurance, and the law of Banks and Banking.

The course on carriers will cover:

1. Carriers, contracts with,
   - (a) Affreightment.
   - (b) Merchant Shipping.
   - (c) Bottomry and Respondentia.

The course on Insurance will cover:

2. Insurance, contracts of,
   - (a) Marine Insurance.
   - (b) Fire Insurance.
   - (c) Life Insurance.

Civil Procedure.

Mr. Gordon W. Macdougall.

This course to the students of the First Year is intended to form an introduction to the subject, to explain the simpler kinds of actions, the general rules of pleading, and the jurisdiction of the several courts.

The revised Code of Civil Procedure for the Province of Quebec is the text-book.

Civil Procedure.

Mr. Percy C. Ryan.

The advanced course for the Second and Third Years covers all matters of procedure not dealt with in the First Year Course, and includes Provisional Remedies, such as capias, attachment before judgment, injunction, etc., and special proceedings, such as proceedings relating to corporations and public offices, mandamus, etc., as well as the rules of pleading in the more complicated classes of action. It will be divided into two parts, one of which will be taken in each alternate year.

Marriage Covenants and Minor Contracts, Prescription, Lease, and Municipal Law.

Professor Fortin.

Two courses. In alternate years.

Successions, Gifts, and Substitutions.

Professor Mr. Justice Doherty.

Two courses. In alternate years.

The Law of Succession.

The course consists of a commentary and explanation of the whole of Title I, and the third Chapter of Title II of the

Third Book of the Civil Code. The order followed by the Code in dealing with the different matters, coming within the scope of this course, has however been departed from with a view to presenting to the Student the Law governing successions as one whole. The subject will be developed as nearly as possible in the following order:—

1. General notions, definitions, and divisions of the subject. The Testamentary Succession. The Ab-Intestate Succession.
2. Rules of Law common to both Successions.
3. Rules peculiar to the Testamentary Succession.
4. Rules peculiar to the Ab-Intestate Succession.
5. Partition of the Succession (and of property held in undivided ownership generally), its incidents and effects.

Obligations.

Mr. Aimé Geoffrion.

This course of lectures will consist of a commentary on the title on obligations in the Civil Code, less the chapter of proof (articles 982 to 1,202 inclusive). Our law on the subject will be compared with the old French law and the modern French law; and its general principles will be explained and illustrated.

Real Property Law, Privileges and Hypothecs, Registration, and Notarial Law.

Professor Marler.

Two courses. In alternate years.

Public International Law.

Professor Lafleur.

Sovereignty and equality of Independent States, Recognition of Belligerency and Independence. Justifiable grounds of intervention. Modes of territorial acquisition. Territorial

boundaries. Doctrine of Exterritoriality. Treaties and Arbitrations. Laws of War. Neutrality of States and of individuals. Laws of Blockade. Contraband. Confiscation. Prize-Courts and their jurisprudence.

The students' attention will be specially directed to Treaties, Diplomatic Relations, and International Arbitrations, in which Canada is directly concerned.

Private International Law.

Professor Lafleur.

Distinction between the *a priori* and positive methods. Sources of the positive law of Quebec on the subjects. Application and illustration of the rules for solving conflicts of law in regard to the different titles of the Civil Code. Comparisons between our jurisprudence and that of England, France, and Germany.

These two courses will be given in alternate years.

SYLLABUS.

Tuesday, 4th September, 1900, Introductory Lecture by the Dean.
Wednesday, 5th September, Ordinary Lectures begin.
Friday, 7th December. Last day for notice to be sent to Secretary of Section of the Bar by candidates at the January Examinations for admission to study or to practise Law in the Province of Quebec.
Monday, 7th January, 1901. Lectures, Second Term, begin.
Tuesday, 8th January. Bar Examinations take place at Montreal.
Tuesday, 30th April. Convocation for Degrees in Law.
Saturday, 1st June. Last day for notice to be sent to Secretary of Section of the Bar by Candidates at the July Examinations for admission to study or to practise Law in the Province of Quebec.
Monday, 2nd July. Bar Examinations take place at Quebec.

EXAMINATIONS.

The University Examinations are held in April, at the close of the session.

REQUIREMENTS FOR DEGREE OF DOCTOR OF CIVIL LAW.

ADOPTED OCTOBER, 1881.

Every Candidate for the degree of D.C.L. in Course must be a Bachelor of Civil Law of twelve years' standing, and must pass such examination for the Degree of D.C.L. as shall be prescribed by the Faculty of Law. He shall also, at least two months before proceeding to the Degree, deliver to the Faculty twenty-five printed copies of a Thesis or Treatise of his own composition on some subject, selected or approved by the Faculty, such Thesis to contain not less than fifty octavo pages of printed matter, and to possess such degree of merit as shall, in the opinion of the Faculty, justify them in recommending him for the degree.

The Examination for the Degree of D.C.L. in Course, shall, until changed, be on the following subjects and authors, with the requirement of special proficiency in some one of the groups below indicated. In the groups other than the one selected by the Candidate for special proficiency, a thorough acquaintance with two works of each group shall be sufficient, including in all cases the work first mentioned in each group and the first two works in the third group. In the first group one work on Public and one on Private International Law must be offered.

1. INTERNATIONAL LAW.

A. Public:—

Twiss, Sir T., Law of Nations.
Hall, W. E., International Law.
Harcourt, Sir W. V., Letters by *Historicus*.
Ortolan, T., Diplomatie de la Mer.
De Martens, Droit International.
Holland, Studies in International Law.

B. Private:—

Savigny, Private International Law (Ed. Guthrie).

Bar, Private International Law (Ed. Gillespie).
Foelix, Droit International Privé.
Laurent, Droit Civil International.
Brocher, Droit International Privé.
Fiore, Droit International Privé (Ed. Pradier-Fodéré).
Dicey, Conflict of Laws.
Story, Conflict of Laws.
Lafleur E., Conflict of Laws.

2. Roman Law.

Maynz, Droit Romain.
Muirhead's Roman Law.
Girard, Manuel de Droit Romain.
Ortolan's Institutes (Ed. Labbé).
Savigny, Roman Law in the Middle Ages.
Cuq, Les Institutions Juridiques.
Puchta, Institutionen.
Krüger, Rômische Rechtsquellen.
Roby's Introduction to the Digest.
Hunter's Roman Law.

3. Constitutional History and Law.

Dicey's Law of the Constitution.
Stubbs' Constitutional History of England.
Hearn, Government of England.
Bagehot, English Constitution.
Franqueville, Gouvernement et Parlement Britanniques.
Gneist, Constitution of England.
Hallam, Constitutional History of England.
May, " " "
Gardiner, " " "
Freeman, Growth of the English Construction.
Mill, Representative Government.
Anson, Law and Custom of the Constitution.

4. Constitution of Canada and Works relevant thereto.

Todd, Parliamentary Government in the British Colonies.
Bourinot, Federal Government in Canada.
Cartwright, Cases under the British North America Act.
Lord Durham's Report on British North America.
Lareau, Histoire du Droit Canadien.
Houston's Constitutional Documents of Canada.
Volume O., Statutes of Lower Canada.
Maseres' Collection of Quebec Commissions.
Laferrière, Essai sur l'Histoire du Droit Français.
Dilke, Problems of Greater Britain.
Bryce, American Commonwealth.
Curtis, History of the Constitution of the United States.
Cooley, Principles of Constitutional Law.

5. Criminal Law, Jurisprudence, and Political Science.

Stephens, History of the Criminal Law.
Blackstone, Vol. IV.
Harris, Principles of Criminal Law.
Holland, Elements of Jurisprudence.
Austin, Lectures, omitting chapters on Utilitarianism.
Lorimer's Institutes.
Amos, Science of Law.
Woolsey, Political Ethics.
Lieber, Political Ethics.
Freeman, Comparative Politics.
Aristotle's Politics, by Jowett.

APPENDIX.

The attention of intending Students is called to the following provisions of the Revised Statutes of Quebec and amendments, as bearing on the requirements for the study and practice of Law in the Province.

Article 3544 R.S.Q.—Examinations for admission to study and to practise law in the Province of Quebec are held at the time and place determined by the General Council.

The places and dates as at present fixed are:

MONTREAL.....Tuesday, 8th Jan., 1901.
QUEBEC.....Tuesday, 2nd July, 1901.

and alternately in Montreal and Quebec every six months, namely—at Montreal, on the second Tuesday of each January, and at Quebec on the first Tuesday of each July.

All information concerning these examinations can be obtained from the General Secretary's Office. The present General Secretary is Arthur Globensky, Esq., Montreal.

Article 3546.—Candidates must give notice as prescribed by this article at least one month before the time fixed for the examination to the Secretary of the Section in which he resides, or in which he has resided for the past six months.

The present Secretary of the Montrea Section is Edmond Brossard, Esq., 66 St James Street, Montreal.

Article 3503a.—Added by Statute of Quebec, 53 Victoria (1890), Cap. 45, provides that Candidates holding the diploma of Bachelor of Arts, Bachelier-es-Lettres, or Bachelier-es-Sciences from a Canadian or other British University are dispensed from the examination for admission to study. Such Candidates are required to give the notice mentioned above.

Article 3548 R.S.Q. (as altered by by-law of the General Council). On giving the notice prescribed by Article 3546, the Candidate pays the Secretary a fee of $2, and makes a deposit of $30 for admission to study, or of $70 for admission to practice, which deposit, less $10, is returned in case of his not being admitted.

Article 3552 (amended 1894, Q. 57 Vic., c. 35).—To be admitted to practice, the Student must be a British subject, and must have studied regularly and without interruption during ordinary office hours, under indentures before a Notary as Clerk, or Student with a practicing Advocate, during Four Years, *dating from the registration of the certificate of admission to study.* This term is reduced to Three Years in the case of a student who has followed a regular law course

in a University or College in this Province and taken a degree in law therein.

The By-Laws passed by the General Council of the Bar of the Province of Quebec, 16th Sept., 1886, and amended 10th Feb., 1892, provide as follows:—

Art. 42.—A course of lectures on law given and followed at a University or College in this Province, and a diploma or degree conferred on students by such university or college, shall be held to be such as contemplated in art. 3552 R.S.Q. only when the university or college conferring the degree and the student who receives it shall have efficiently followed the programme herein set forth. This article and article 44 shall apply to students already admitted only as regards lectures to be given after the 1st of January, 1887.

2. The subjects on which lectures shall be given, and the number of lectures required on each subject for a regular course of lectures on law in a university or college shall be as follows:—

ROMAN LAW:—103 Lectures.

This subject shall include an introduction to the study of Law and the explanation of and comments on the Institutes of Justinian and the principal jurisconsults of Rome.

CIVIL, COMMERCIAL, AND MARITIME LAW:—413 Lectures.

Lectures on these subjects shall cover at least three years. They consist of the history of French and Canadian law, the explanation of and comments on the Civil Code of the Province of Quebec and the Statutes relating to Commerce and Merchant Shipping.

CIVIL PROCEDURE:—103 Lectures.

Lectures on this subject shall extend over at least two years. It shall consist of the explanation of and comments on the Code of Civil Procedure and the Statutes amending it, the organization of the Civil Courts of this Province and

the history of the different judicial systems of the country; also, the special modes of procedure provided by statutes and laws of general application.

INTERNATIONAL LAW, Private and Public:—21 Lectures.

CRIMINAL LAW:—69 Lectures.

This subject includes the history of criminal law in Canada, the constitution of criminal courts, criminal procedure, comments on statutes relating to criminal law, the relation of criminal law in Canada to the criminal law of England. The lectures shall extend over two years.

ADMINISTRATIVE AND CONSTITUTIONAL LAW:—41 Lectures.

These subjects include an inquiry into the different political institutions and the public institutions of the country, the powers, organization and procedure of the Federal Parliament and of the Local Legislature, the laws on Education and the Municipal Code.

Art. 43.—Candidates for practice who hold a degree in law from a university or college in this Province shall produce, with their notices, a certificate from the principal or rector of such university or college to the effect that they followed a course of lectures on law in the same, during at least three years, in conformity with the by-laws of the Bar; and such certificate shall further specify the number of public lectures at which they shall have attended on each subject mentioned in the foregoing programme, during each of the said three years. The last part of this certificate shall only be required for courses of lectures given after the 1st January, 1897.

Art. 44.—The examiners shall not consider a university degree in law valid for the purposes of admission to the Bar if they find that the candidate has not in fact followed the programme above.

TIME TABLE.

INTRODUCTORY LECTURE, TUESDAY, 4TH SEPT., 4 P.M.

FIRST YEAR STUDENTS, 1900-1901.

WEDNESDAY, 5TH SEPT., TO FRIDAY, 2ND NOV., 9 WEEKS.

HOURS.	MONDAY	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
8.30	Obligations. Mr. A. Geoffrion	Procedure. Mr. Gordon Macdougall.	Obl.	Procedure.	Obl.
4.00	Roman Law. The Dean.	Rom.	Rom.	Rom.	Constitutional Law. The Dean.
5.00	Legal History. Prof. McGoun.	Persons. Prof. Lafleur.	Hist.	Persons.	Hist.

MONDAY, 5TH NOV., TO FRIDAY, 14TH DEC., 6 WEEKS.

HOURS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
8.30	Obl.	Procedure.	Obl.	Proced.	Obl.
4.00	Rom.	Rom.	Rom.	Rom.	Const.
5.00	Real Rights. Prof. Marler.	Persons.	Real Rights.	Persons.	Real Rights.

CHRISTMAS.

MONDAY, 7TH JAN., TO FRIDAY, 8TH MARCH, 9 WEEKS.

HOURS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
8.30	Obl.		Obl.		Obl.
4.00	Rom.	Rom.	Rom.	Rom.	Rom.
5.00	R. R. 3 wks.	Constitutional Law. The Dean.	R. R.	Const.	R. R.

MONDAY, 11TH MARCH, TO FRIDAY, 29TH MARCH, 3 WEEKS.

HOURS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
8.30					
4.00	Rom.	Const.	Rom.	Const.	Rom.
5 00	Criminal Law. Prof. Mr. Justice Davidson.	Crim.	Crim.		Crim.

Roman Law	115 lectures.	Criminal	10 lectures.
Legal History	25 "	Constitutional and Administrative Law	39 "
Persons	25 "	Total	314
Real Rights	25 "		
Procedure	25 "		
Obligations	50 "		

TIME TABLE.

INTRODUCTORY LECTURE, TUESDAY, 4TH SEPT,, 4 P.M.

SECOND AND THIRD YEAR STUDENTS, 1900-1901.

WEDNESDAY, 5TH SEPT., TO FRIDAY, 2ND NOV., 9 WEEKS.

HOURS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
8.30	Successions. Prof. Mr. Justice Doherty.	Civ. Procedure. Mr. Ryan.	Successions.	C. P.	Successions.
4.00	Prescription. Prof. Fortin.	Prescription.	Roman Law of Contracts. The Dean.	Prescription.	Prescription.
5.00	Criminal Law. Prof. Mr. Justice Davidson.	Commercial Law. Prof. R.C.Smith	Crim.	Comm. Law.	Crim.

N.B.—The lectures on Successions, will begin Monday, 10 Sept.

MONDAY, 5TH NOV., TO FRIDAY, 14TH DEC., 6 WEEKS.

HOURS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
8.30	Successions.	C. P.	Successions.	C. P.	Successions.
4.00	Lease, &c. Prof. Fortin.	Lease, &c.		Lease, &c.	Lease, &c.
5.00	Criminal.	Commercial Law.	Crim.	Comm. Law.	Crim.

MONDAY, 7TH JAN., TO FRIDAY, 8TH MARCH, 9 WEEKS.

HOURS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
8.30	Successions. 5 wks. C.P. 4 weeks.	Corporations. Prof. McGoun.	Successions. C. P.	Corporations.	Successions. C. P.
4.00	Real Property Law. Prof. Marler. 6 weeks. N.B. This course will begin after the completion of Prof. Marler's course to the first year.		R. P. L.		R. P. L.
5.00	Public Internat. Law. Prof. Lafleur.	Commercial Law. Prof. R. C. Smith	P. I. L.	Comm. Law.	P. I. L.

MONDAY, 11TH MARCH, TO FRIDAY, 29TH MARCH, 3 WEEKS.

HOURS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
8.30	Corporations.	C. P.	Corporations.	C. P.	Corporations.
4.00	R. P. L.		R. P. L.		R. P. L.
5.00	Commercial Law.	P. I. L.	Comm. Law.	P. I. L.	Comm. Law.

Successions	50 lectures.	Criminal Law	40 lectures.
Commercial Law	50 "	Procedure	40 "
Corporations	25 "	International	25 "
Real Property Law	25 "	Roman	9 "
Prescription	25 "	Total	314 "
Lease, &c	25 "		

In addition a short course on Medical Jurisprudence will be given on dates to be afterwards fixed.

Faculty of Medicine.

The Sixty-eighth Session of this Faculty will be opened on Thursday, September 20th, 1900, by an introductory lecture at 3 pm. The regular lectures in all subjects will begin on September 22nd, at the hours specified in the time-tables, and will be continued until May 25th, 1901, when the annual examination will begin.

The Medical School of McGill University was founded in 1822 as the "Montreal Medical Institution," by Drs. W. Robertson, W. Caldwell, A. F. Holmes, J. Stephenson and H. P. Loedel—all of them at the time members of the staff of the Montreal General Hospital.

Although founded in 1822, yet no session of the "Medical Institution" was held until 1824, when it opened with 25 students ; in 1844 the number of students in the Faculty was 50 ; in 1851, 64, with 15 graduates ; in 1872-73, 154, with 35 graduates ; in 1892-93, 315, with 46 graduates ; in 1895-96, 419, with 90 graduates ; in 1899-1900, the session just completed, 457 undergraduates were registered.

There were no sessions held during the political troubles from 1836 to 1839, and it is owing to this fact that the present is the 68th session of the Faculty. This is in reality the seventy-first session of the school, which is the direct continuation of the "Montreal Medical Institution."

In 1828 the "Medical Institution" was recognized by the Governors of the Royal Institution as the Medical Faculty of McGill University. At this time the lectures were given in a building on the site of the present Bank of Montreal. Later the school was removed to a brick building, still standing near the corner of Craig and St. George streets.

In 1846 the lectures of the Faculty were given in the present central building of the University now occupied by the Faculty of Arts. On account of the inconvenience arising from the distance of the University buildings from the centre of the city, it was decided in 1850 to erect a Medical school building on Cote Street. This building, provided with ample

Medical Building.

accommodation for Library and Museum, and furnished with a large dissecting room and two lecture rooms, it was occupied for the first time during the session of 1851-52, and sufficed for the wants of the Faculty until 1872-73, when the front building of the present block was provided by the Governors of the University.

In 1885 the building in the University grounds, erected by the Governors for the use of this Faculty, was found inadequate. A new building was then added, which at the time afforded ample facilities for carrying out the great aim of the Faculty,—that of making the teaching of the primary branches thoroughly practical.

Owing to the larger classes and the necessity of more laboratory teaching, the Lecture Rooms and Laboratories added in 1885 soon became insufficient in size and equipment to meet the requirements of the Faculty. The late Mr. John H. R. Molson with timely generosity came to the aid of the Faculty, and in 1893 purchased property adjoining the college grounds, and enabled the Faculty to erect new buildings and extensively alter and improve those already in use.

These wings were completed and officially opened by His Excellency, the Earl of Aberdeen, visitor of the University, January 8th, 1895. They were erected as an extension of the old ones, towards the northwest, partially facing Carlton road, and convenient to the Royal Victoria Hospital. They connected the Pathological building, acquired in 1893, with the older buildings, and comprised a large lecture room, capable of accommodating 450 students, with adjoining preparation-rooms and new suites of laboratories for Pathology, Histology, Pharmacology and Sanitary Science. The laboratories, etc., in the older buildings were greatly enlarged and improved; the whole of the second floor was devoted to the department of anatomy, and consisted of dissecting-room, anatomical museum and bone-room, preparation rooms, Professors' and Demonstrators' rooms, and a special Lecture Room.

On the ground floor the Library and Museum were greatly enlarged; a room forming part of the Library was furnished as a reading room for the use of students, where the extensive reference library of the Faculty may be consulted.

On this floor are situated the Faculty room, the Registrar's office, the special museum for Obstetrics and Gynaecology, together with Professors' rooms, etc. The chemical laboratories were increased by including the laboratories formerly used by the department of Physiology.

In the basement are placed the janitor's apartments, cloak rooms with numerous lockers for use of students, the Lavatory, etc., recently furnished with the most modern sanitary fittings.

The Faculty has much pleasure in announcing that by the generosity of Lord Strathcona it is now beginning very extensive alterations and largely increasing its buildings. During the summer of 1900 the first two wings of the new building will be erected. One wing will replace the brick lecture room on the west side of the building. This will be a massive stone structure, harmonious in architecture with the wing erected in 1895. On the ground floor of this wing will be the Faculty room, a fireproof stack-room adjoining the present library; the Registrar's offices and Professors' rooms; above these on the next floor there will be a large lecture room, especially arranged for the teaching of anatomy, with numerous small laboratories for anatomy.

The wing now occupied by the laboratories for pathology will be removed, and a wing 100 feet long and 40 feet deep will be erected in its place. This will be especially constructed for laboratories, and will contain the laboratories for Pharmacology, Chemistry, Pathology, Bacteriology and Hygiene, as well as numerous private laboratories connected with those for the use of the students.

These wings form a portion of a scheme of reconstruction of the present medical buildings whereby a symmetrical stone structure will replace the irregular set of buildings now occupied by the Faculty. The replacing of the older portions of the medical buildings by new wings has been spread over several years so as not to interrupt or disturb the regular teaching work of each session.

Lecture Rooms.

In the buildings now occupied by the Faculty, as will be seen by reference to the diagrams, in addition to the labora-

tories, dissecting room, etc., there are three large lecture rooms, two capable of comfortably seating about 300 students, and one for general lectures, sessional examinations, etc., capable of seating 450 students. The seats are numbered, and a lecture room ticket securing a seat for the session is given each student on enregistering and paying the sessional fee.

Rooms for Students Use.

Three cloak rooms are provided in convenient portions of the buildings, and, in addition, commodious lockers can be procured at a nominal rental. A large well-lighted reading-room containing newspapers, magazines and the current medical journals is provided, and is managed by the students themselves. The original library has been refitted as a reading-room for students desiring to avail themselves of the reference works in the library of the Faculty.

Dissecting Room.

The Dissecting Room, which is situated on the second floor, is L-shaped, one arm of which is 76 feet in length and 31 feet in breadth and the other arm 45 by 32. It is supplied with thirty dissecting tables and over 200 specially constructed lockers, and is well lighted for work during the day and night.

In connection with the dissecting-room there is a Bone room and Anatomical Museum where students have an excellent opportunity of studying osteology, frozen sections, anatomical models and dry preparations. In connection with the bone room is a small but well arranged museum of comparative osteology. There are also rooms for the demonstrators of anatomy.

Physiological Laboratories.

The Physiological Laboratories, which are situated on the upper floor, facing the west, are supplied with the most modern apparatus for the practical teaching of this rapidly growing and important branch of the medical curriculum. They consist of one large room forty-five by thirty-five feet for undergraduate work, and two smaller ones for more ad-

vanced work and private research. In addition there is a room set apart for a consulting library and for the special use of the Professor of this department. The Student's laboratory is arranged in such a way as to permit of students assisting at and taking part in the more elaborate demonstrations, as well as undertaking experiments independently for themselves.

A recent grant from the Faculty, which was supplemented from private sources, has allowed of the partial equipment of an additional branch of the subject which it is the intention to extend, as well as to augment the resources of other departments of practical physiology in the immediate future.

Histological Laboratories.

The Histological Laboratory proper is a large, well-lighted room on the second floor of the new building. It is so arranged that over eighty students can be present at the microscopical demonstrations. It is supplied with 75 microscopes. In addition to the students' laboratory there is a smaller laboratory adjoining for the use of the professor and demonstrators and for special work.

Pharmacological Laboratory.

The Pharmacological Laboratory is a large room 45 by 35 feet, situated on the second floor of the new building, and is now furnished with the necessary appliances for the practical teaching of pharmacology. In this room is placed a teaching museum of drugs and pharmaceutical preparations arranged according to their physiological action; and tables arranged for teaching dispensing and the preparation of medicines.

Chemical Laboratory.

The Chemical Laboratory is large, lofty and lighted from three sides. It can accommodate 124 men, but only a much smaller number is allowed to work at one time. Each student, when entering on this course, has a numbered table in the laboratory assigned to him for his use during the session. Each table has its own gas and water fixtures, and is provided with shelves for its corresponding set of reagent-bottles, as well as a drawer and locker containing set of chemical appa-

ratus especially adapted for the work. This apparatus is provided by the Faculty, and supplied to each student without extra charge. The student is only required to pay for apparatus broken or destroyed.

The laboratory is fully equipped for the various courses of study, giving the student unsurpassed advantages for acquiring a sound and practical knowledge of medical chemistry.

Pathological Laboratories.

A building of three stories, 47 by 40 feet, adjoining the College, recently acquired by the Faculty, thanks to the generosity of the late Mr. J. H. R. Molson, constitutes the Pathological Laboratory; it has undergone extensive alterations to fit it for the purpose. The uppermost floor has been converted into a work-room for the osteologist and curator, the second floor is one large laboratory for class work in Practical Pathology and Bacteriology; upon the floor beneath are two laboratories for research, a preparation room, professor's private room and library, and culture rooms; while upon the ground floor are rooms for the attendant, for storage and for keeping animals.

Endowments.

The first endowments of the Faculty were the "Leanchoil" and "Campbell Memorial" funds. The former was a gift of Lord Strathcona; the latter subscribed by the citizens of Montreal and graduates of Medicine of the University. A portion of these funds was expended in increasing the laboratory and lecture room accommodation in 1885, the interest on the balance being applied to general maintenance.

In 1893 Lord Strathcona endowed the Chairs of Pathology and Public Health with $100,000. This gift enabled the Faculty to equip and develop these departments until they are quite up to the requirements of modern medical science.

Various other endowments, such as the Drake Endowment of Physiology and the bequests of the late Mrs. Mary Dow, Mrs. John MacDougall and Miss Jane Learmont, have enabled the Faculty to maintain a high standard of laboratory teaching without proportionately increasing the cost of the course to the student.

Last year Lord Strathcona and Mount Royal again came

to the aid of the Faculty. He gave, in the names of Lady Strathcona and the Honorable Mrs. Howard, one hundred thousand dollars, to be used partially to meet the cost of extending the Laboratories, Library and Museum, and partially as a fund, the interest on which is to be applied to replace the loss of the graduation fees, formerly used to support the Medical Library and Museum, but which are now required by the Governors for general university expenses outside the Faculty of Medicine.

The thanks of the Faculty are also due to Mr. David Morrice, who has recently come forward with a donation of upwards of three thousand dollars to meet the cost of increasing the equipment of the Laboratory of Pharmacology.

MATRICULATION.

For particulars of the University Matriculation, see pp. 9-17.

The matriculation requirements for those who intend to practise in any of the Provinces of Canada, or in Great Britain, etc., are as follows:—

A. *Matriculation Examination for those who wish to obtain a license to practise in England, India, or any other British Possession (Canada excepted).*

The Matriculation Examination in Medicine of this University, as described on pp. 9-17, is accepted by the General Medical Council of Great Britain and Ireland. Graduates of this University desiring to register in England are thus exempted from any examination in preliminary education on production of the McGill Matriculation certificate, together with a certificate that all the subjects of this Examination were passed at one time. Certificates of this University for attendance on lectures are also accepted by the General Medical Council of Great Britain.

B. *Matriculation Examination for those who wish to obtain a license to practise in the Province of Quebec.*

No University Matriculation Examination is accepted by the College of Physicians and Surgeons of this Province. Graduates in Arts of any British or Canadian University are however exempted from examination on presentation of their Diplomas.

Those who pass the Preliminary Examination described below, or Graduates in Arts who register as students in the C. P. & S., Quebec, *on beginning their studies in Medicine*, obtain on graduating from McGill University a license to practise in Quebec without further examination in any professional subject.

The requirements for this examination:—

LATIN.—Cæsar's Commentaries, Bks. I., II., III., IV. and V.—Virgil's Aeneid, Bks. I. and II.—The Odes of Horace, Bk. I., with a sound knowledge of the Grammar of the Language.

ENGLISH.—For *English-speaking* candidates.—A critical knowledge of one of Shakspere's plays, viz., Twelfth Night, for 1900, with English Grammar, as in Dr. Smith or Mason.

For *French-speaking* candidates.—Translation into French of passages from the first eight Books of Washington Irving's Life of Columbus, with questions on Grammar. Translation into English of extracts from Fénélon's Télémaque.

FRENCH.—For *French-speaking* candidates.—A critical knowledge of Molière's Le Bourgeois Gentilhomme, Fénélon's Aventures de Télémaque and La Fontaine's Fables, Bks. I., II., III., with questions on Grammar and Analysis.

For *English-speaking* candidates.—Translation into English of passages from Fénélon's Télémaque, with questions on Grammar. Translation into French of easy English extracts.

BELLES LETTRES AND RHETORIC.—Principles of the subject as in Haven's Rhetoric, or Boyd's Rhetoric and Literary Criticism. History of the Literature of the age of Pericles in Greece, of Augustus in Rome, and of the 17th and 18th centuries of England, and France.

HISTORY.—Outlines of the History of Greece and Rome, and particular knowledge of the History of Britain, France and Canada.

GEOGRAPHY.—A general view, with particular knowledge of Britain, France and North America.

ARITHMETIC.—Must include Vulgar and Decimal Fractions, Simple and Compound Proportion, Interest and Percentages, and Square Root.

ALGEBRA.—Must include Fractions and Simultaneous Equations of the First Degree.

GEOMETRY.—Euclid, Bks. I., II., III. and VI., or the portion of plain Geometry covered by those Books. Also the measurement of the lines, surfaces and volumes of regular geometrical figures.

CHEMISTRY.—Outlines of the subject as in Remsen's Elements of Chemistry.

BOTANY.—Outlines as in Gray's "How plants grow."

PHYSICS.—Outlines as in Peck-Ganot's Physics.

PHILOSOPHY.—Elements of Logic as in Jevon's Logic; Elements of Philosophy, as in Professor Murray's Hand-Book.

The Examinations will be held in September, 1900, at Quebec, and in June, 1901, at Montreal. Applications to be made to Dr. J. A. Macdonald, No. 1 Belmont Street, who will furnish schedule giving text-books and percentage of marks required to pass in each subject.

Examination Fee, twenty dollars. Should the candidate be unsuccessful, one-half of the fee will be returned.

Of the four years' study *after* having passed the Matriculation Examination, three six months' sessions, at least, must be attended at a University, College or Incorporated School of Medicine recognized by the "Provincial Medical Board." The first session must be attended during the year immediately succeeding the Matriculation Examination, and the final session must be in the fourth year.

C. *To obtain a license to practise in Ontario.*

Every one desirous of being registered as a matriculated medical student in the register of the College of Physicians and Surgeons of this Province, except as hereinafter provided, must present to the Registrar the official certificate of having passed the "Departmental Pass Arts Matriculation Examination," and in addition Physics and Chemistry—whereupon he shall be entitled to be so registered upon the payment of twenty dollars and giving proof of his identity.

Graduates in Arts of any University in Her Majesty's dominions, are not required to pass this examination, but may register their names with the Registrar of the College, upon giving satisfactory evidence of their qualifications, and upon paying the fee of twenty dollars.

A certificate from the Registrar of any chartered University conducting a full Arts course in Canada, that the holder thereof matriculated prior to his enrolment in such University, and passed the examination in arts prescribed for students at the end of the first year, shall entitle such student to registration as medical student under *The Ontario Medical Act.*

Every medical student, after matriculating, shall be registered in the manner prescribed by the Council, and this shall be held to be the beginning of his medical studies, which shall date from that registration.

Full details may be obtained on application to Dr. R. A. Pyne, Registrar, Cor. Bay and Richmond Sts., Toronto.

D. *To Practise in the Maritime Provinces.*

The examination required by the Faculty of Medicine of this University is accepted in the provinces of Nova Scotia, New Brunswick, and Prince Edward Island, and in Newfoundland, subject to the following conditions:

The Nova Scotia, New Brunswick, and Prince Edward Island Medical Boards require a standard of 60 per cent., and Physics to be taken as the optional subject.

The Newfoundland Medical Board accepts the McGill Ma-

triculation, as it is identical with the Arts Matriculation, but requires Physics in addition.

Students desiring ultimately to practise in any of these provinces should, when enregistered in the Faculty of Medicine, notify the Registrar of that province of the fact, and have their matriculation enregistered.

The Registrars are: for Nova Scotia, Dr. A. H. W. Lindsay, Halifax; for Newfoundland, Dr. J. Sinclair Tait, St. John's; and for New Brunswick, Dr. Stewart Skinner, St. John, N.B., who will furnish all details of requirements, etc.

Special matriculation examinations are held annually in New Brunswick and Nova Scotia.

These examinations, as stated above, are accepted by this University as equivalent to its Matriculation Examination.

E. *To obtain license to Practise in Manitoba.*

An examination accepted by the University of Manitoba as equivalent to their matriculation is required on entrance, and to obtain License an examination in Professional subjects is required. Dr. J. S. Gray, of Winnipeg, Manitoba, is the Provincial Registrar.

F. *To obtain license to Practise in North-West Territories.*

No special matriculation standard is specified. Licensed practitioners of any of the other provinces are admitted to practise without examination.

Those not licensed to practise elsewhere in Canada are examined in professional subjects only. Dr. H. W. Bain, of Prince Albert, is Registrar of the Province.

G. *To Practise in British Columbia.*

No special standard of matriculation is specified.

All desiring a license must be graduates of some recognized medical school, and pass an examination in professional subjects only. Dr. C. J. Fagan, of New Westminster, is the Provincial Registrar.

REGISTRATION.

For regulations governing registration for entrance in any years of the course, see pp. 18, 19.

The class tickets for the various courses are accepted as qualifying candidates for examination before the various Colleges and Licensing bodies of Great Britain and Ireland and the College of Physicians and Surgeons of Ontario. The degree in Medicine of this University carries with it at the Licensing Boards of Great Britain the same exemptions in certain subjects as are granted to all colonial degrees.

To meet the circumstances of the General Practitioners in British North America, where there is no division of the profession into Physicians and Surgeons exclusively, the degree awarded upon graduation is that of "Doctor of Medicine and Master of Surgery" in accordance with the general nature and character of the curriculum, as fully specified hereafter. The degree is received by the College of Physicians and Surgeons of the Province of Quebec, provided the graduate from this university matriculated before the College of Physicians and Surgeons of Quebec when entering on the study of medicine. Any graduate therefore in medicine of this University may obtain a license to practice in the Province of Quebec without further examination if he has complied with the above regulations.

TIME TABLE FOR SESSION 1900-1901.

Time Tables for the Session of 1900-01 will be issued to each student with his Lecture Room ticket on enregistration.

TIME TABLE OF FIRST YEAR LECTURES.

LECTURES.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Lecture Theatre.
Anatomy	9	9	9	9	9	....	Autumn & Winter Terms-No I.
Physiology	4	4	.....	4	.....	.....	No. I.
Chemistry	.....	3	.....	3	3	....	Autumn Term No. III.
	.....	.....	2	.....	2	....	Winter and Spring Terms—No. III
Biology	.....	11	.....	11	.....	10	Autumn & Winter Terms.
	.....	4	.....	4	.....	.....	Autumn Term.
LABORATORY WORK.							
Practical Anatomy	10–12½	10–12½	10–12½	10–12½	10–12½	9–12½	
*Prac. Physiology	.....	....	3–5	.....	.....	.....	
*Prac. Histology	2–4	.....	.....	.....	4–6	10–12	
*Prac. Chemistry	9–11	9–11	9–11	9–11	.....	.....	Autumn Term.
*Prac. Biology	3–5	.....	3–5	.....	.....	.....	Autumn Term.

*Class taken in division.

TIME TABLE OF SECOND YEAR LECTURES.

LECTURES.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Lecture Theatre.
Anatomy	9	9	9	9	9	....	Autumn & Winter Terms -No. I.
Physiology	2	.....	2	.....	2	.....	No. I.
Chemistry	3	.....	3	.....	3	.....	
Pharmacology and Therapeutics	4	.....	4	.....	4	.....	No. I.
LABORATORY WORK.							
Anatomy	10	10	10	10	10	10	
	12.30	12.30	12.30	12.30	12.30	12.30	Autumn & Winter Terms.
†Prac. Chemistry	9–11	9–11	9–11	9–11	9–11	9–11	Spring Terms
†Prac. Physiology	.....	2–4	.....	2–4	.....	.....	

†Half the class only.

NOTE—Students of the second year when not engaged in the laboratories are required to attend the Out Patients' Clinics (only) of M. G. H. or R. V. H. (11 a.m. to 1 p.m.); attendance to average two hours per week. Certificates required for graduation.

TIME TABLE OF THIRD YEAR LECTURES.

LECTURES.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Lecture Theatre.
Gynæcology and Obstetrcs	9	....	.....	9	.....	.....	II
Medicine	.....	10	*11-12	10	.....	.....	III
Surgery	10	.....	*12-1	.....	10	.....	III
Jurisprudence and Mental Diseases	11	.....	.....	11	.....	.....	II
Pharmacology and Therapeutis	.....	11	.....	.....	11	.....	III
Gen. Pathology and Bacterology	5	.....	9	.....	.....	.....	III
Hygiene	.....	9	.....	.....	9	.....	III
Morbid Anatomy	.....	.....	.....	.....	.....	*9-11	
Clinical Medicine	.....	1 p.m. MGH	.....	2 p.m RVH	.....	.....	
Clinical Surgery	2 p.m. RVH	.....	.....	.....	1 p.m. MGA	.....	
Practical Pathology	.....	4-6	4-6	4-6	4-6	.....	Path. Lab. Winter.
‡Clinical and Sanitary Chemistry	.....	4-6	4-6	4-6	4-6	.....	Chem. Lab. Autumn
‡Bacteriology and Hygiene	.....	4-6	4-6	4-6	4-6	.....	Path. Lab. Autumn
††Clinical Microscopy	.....	4-6	4-6	4-9	4-6	.....	Path. Lab. Spring
‡†Operative Surgey	.....	4-6	4-6	4-6	4-6	.....	Anat. Lab. Spring

*Alternate weks M.G.H. and R.V.H. †Optional. ‡Classes taken in groups.

TIME TABLE OF FOURTH YEAR LECTURES.

LECTURIS.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Lecture Theatre.
Gynæcology	.....	9	.....	.....	.....	.....	II
Obstetrics	.....	.....	9	.....	11	.....	II
Medicine	.....	10	‡11-12	10	.....	.....	III
Surgery	10	.....	‡12-1	.....	10	.....	III
Med. & Surg. Patology	.....	.....	....	9	.....	.....	III
Ophthalmology	9	.....	.....	.....	.....	.....	II
*Out Patients' Clinics	11-12 12-1	11-12 12-1	11-12 12-1	11-12 12-1	11-12 12 1	11-12	R.V.H. M.G.H.
Clinical Medicine	 1	.....	.....	.....	2	.....	R.V.H.
Clinical Surgery	.....	1	.....	.....	.....	.....	M.G.H.
Gynæcological Operations	.....	11	.....	2	.....	.....	M.G.H. R.V.H.
*Clinical Ophthalmology	4	 4	4	....	 4	....	R.V.H. M.G.H.
†Gynæcological Clincs	 11	4	.....	4 4	.....	....	R.V.H.
Morbid Anatomy	.....	.....	.....	.....	.....	‡9-11	
Clinical Obstetrics	.....	.....	.....	.....	.....	1-2.30	Maternity Hosp.
*Dermatological Clinic	.....	.....	2	.....	.....	.....	M.G.H.
Genito-Urinary Clnic	.....	.....	.....	.....	.....	3	R.V.H.
*Diseases of Children Clinic	.....	4	.....	.....	4	.....	M.G.H.
*Laryngology	4	.....	.....		4	.....	M.G.H.
Medical and Surgcal Anatony	5	.....	.....	.....	.....	.....	Autumn term.
Children's Diseases	5	.....	.....	.....	.....	.....	Winter term.

*In groups of eight or ten. †In groups of four. ‡Alternate weeks M.G.H. and R.V.H.

II.

COURSES OF LECTURES

The Corporation of the University, on the recommendation of the Faculty of Medicine, in 1894, consented to the extension of the courses of lectures in medicine over a period of about nine months instead of six.

By this means, (1) The students of the primary years have a more ample opportunity of becoming acquainted, by laboratory work, with those branches of study which form the scientific basis of their profession, and (2) the final students will be able to derive the greatest benefit from the abundance of clinical material provided in the two Hospitals.

By this arrangement, while the actual number of didactic lectures per session will be decreased, there will be a corresponding increase in the amount of tutorial work and individual teaching in the laboratories for Chemistry, Physiology, Anatomy, Pathology and Hygiene as well as giving more time, during the last two years of the course, for the thorough study of disease in the wards of the Royal Victoria and Montreal General Hospitals.

The Faculty expects, by thus increasing the time that the different professors, lecturers and demonstrators devote to each student, to accomplish two very important ends: First, to do away with the injurious effects which result from attempting to condense the teaching of medicine and surgery into four or even five sessions of six months; Second, to give each student a sounder and more thoroughly practical knowledge of his profession than could be obtained by attending during even five sessions of six months each.

ANATOMY.

PROFESSOR, FRANCIS J. SHEPHERD.

LECTURER, J. A. SPRINGLE.

LECTURER and SENIOR DEMONSTRATOR, J. G. McCARTHY.

DEMONSTRATORS
- *R. TAIT MACKENZIE.*
- *J. A. HENDERSON.*
- *J. J. ROSS.*
- *A. E. ORR.*

ASSISTANT DEMONSTRATORS,
- *A. T. BAZIN.*
- *H. M. CHURCH.*
- *W. G. REILLY.*
- *R. A. WESTLEY.*

Anatomy is taught in the most practical manner possible, and its relation to Medicine and Surgery fully considered. The lectures are illustrated by the fresh subject, moist and dry preparations, sections, models and plates, and drawings on the blackboard.

A course of practical demonstrations in Medical, surgical and Topographical Anatomy is also given in the final year of the course.

The department of *Practical Anatomy* is under the direct control and personal supervision of the Professor of Anatomy, assisted by his staff of Demonstrators.

The methods of teaching are similar to those of the best European schools, and Students are thoroughly grounded in this branch.

Every student must be examined *at least* three times on each part dissected, and no certificate is given unless the examinations are satisfactory.

Special Demonstrations on the Brain, Thorax, Abdomen, Bones, etc., are frequently given. Prizes are awarded at the end of the Session for the best examination on the fresh subject.

The Dissecting Room is open from 9 a. m. to 6 p. m. Abundance of material can be obtained, owing to the Anatomy Act of the Province of Quebec.

CHEMISTRY.

PROFESSOR, GILBERT P. GIRDWOOD.

The course of this subject is carefully graded. Students of the first year receive lectures on Chemical and Physiological Physics and the general principles and theories of the science. In the second year the course on chemistry is extended to embrace its application to physiology and medicine, and includes a course in Organic Chemistry. The lectures are fully illustrated by experiments, for which the department is equipped with all modern Lecture-room apparatus.

PRACTICAL CHEMISTRY.

PROFESSOR, R. F. RUTTAN.

ASSISTANT DEMONSTRATORS, { W. K. BROWN, A. T. IRVINE,

LABORATORY ASSISTANT, CHARLES STEVENSON.

Laboratory instruction in practical chemistry is given during each of the first three years of study throughout one term. The first year's course illustrates the general principles of chemical action and the properties of typical elements. During the second year the course will include methods of qualitative analysis and the detection of poisons. In the third year a course of clinical and sanitary chemistry is given, in which the student is made familiar with the application of chemistry to the diagnosis and prevention of disease. Special attention is directed to instructing the student in making accurate notes of his experiments and his conclusions. These notes are examined daily and criticised.

PHYSIOLOGY.

The JOSEPH MORLEY DRAKE, PROFESSOR.—WESLEY MILLS.

LECTURER, W. S. MORROW.

DEMONSTRATORS, J. W. SCANE and A. A. ROBERTSON.

The purpose of this course is to make Students thoroughly acquainted, as far as time permits, with modern Physiology; its methods, its deductions, and the basis on which the latter

rest. Accordingly a full course of lectures is given, in which the physical, the chemical and other aspects of the subject receive attention.

In addition to the use of diagrams, plates, models, etc., every department of the subject is experimentally illustrated. The experiments are mostly free from elaborate *technique*, and many of them are of a kind susceptible of ready imitation by the Student.

Laboratory work for Senior Students:—

(1.) During a part of the Session there will be a course on Physiological Chemistry, in which the Student will, under direction, investigate food stuffs, digestive action, blood, and the more important secretions and excretions, including urine. All the apparatus and material for this course will be provided.

(2.) The remainder of the Session will be devoted to the performance of experiments which are unsuitable for demonstration to a large class in the lecture room, or that require the use of elaborate methods, apparatus, etc., together with such as each individual of the class can himself conduct.

Laboratory work for Junior Students:—

This will be somewhat similar to the course for senior students, but simpler and anatomico-physiological rather than chemical; like the work for second year students, its main object will be the illustration of important physiological principles.

HISTOLOGY,

PROFESSOR, GEO. WILKINS.
DEMONSTRATOR, N. D. GUNN.
ASSISTANT DEMONSTRATORS, *HUGH B. FRASER.*, *WALTER B. FISKE.*, *E. R. BROWN.*, *DAVID PATRICK.*

The teaching of Histology and Microscopical Methods is spread over two years. During both years practical instruction will be given upon the preparation and mounting of

specimens. Students will also be required to make drawings of the specimens prepared by them.

For the first year students, work will commence immediately after the Christmas holidays and continue until the end of the session. The course will consist of laboratory work and demonstrations, with occasional lectures upon elementary and systematic histology up to and including the digestive system. At the end of the session a practical examination will be held on the work done.

The second year students will commence work with the beginning of the session and continue until the Christmas holidays. The course will be a continuation of the first year's work, completing the subject of histology. Demonstrations will be given embracing the whole subject. The examinations will be held at the end of the course and will be both written and practical, and cover the whole of histology.

PHARMACOLOGY AND THERAPEUTICS.

PROFESSOR, A. D. BLACKADER.
DEMONSTRATOR, R. A. KERRY.

The lectures on this subject are graded in the following manner:

During the primary course attention is directed chiefly to Pharmacology, including the important chemical and physical properties of the various drugs, and a brief consideration of their physiological action; therapeutics is considered only in outline. A complete museum of Materia Medica affords the student opportunity for making himself acquainted with the drugs themselves. During the session a course of demonstrations on Practical Materia Medica and Pharmacy is given.

During the final course the psysiological action of drugs is dwelt upon at length, and attention is given to the therapeutic application of all drugs and remedial measures. Prescription writing and the various modes of administering drugs are explained and illustrated. During the course a series of lectures will be delivered in the theatres of the hospitals on special cases or groups of cases, illustrating important points in both general and special Therapeutics.

MEDICINE.

PROFESSOR, JAMES STEWART.

ASSISTANT PROFESSORS, { *F. G. FINLEY.* / *H. A. LAFLEUR.* / *C. F. MARTIN.*

LECTURERS, { *G. GORDON CAMPBELL.* / *W. F. HAMILTON.*

DEMONSTRATOR, S. RIDLEY MACKENZIE.

While the lectures on this subject are mainly devoted to Special Pathology and Therapeutics, no opportunity is lost of illustrating and explaining the general laws of disease. With the exception of certain affections seldom or never observed in this country, all the important internal diseases of the body, except those peculiar to women and children, are discussed, and their Pathological Anatomy illustrated by the large collection of morbid preparations in the University Museum, and by fresh specimens contributed by the Professor of Pathology.

The College possesses an extensive series of Anatomical plates and models illustrative of the Histological and Anatomical appearances of disease, and the wards of the General and Royal Victoria Hospitals afford the lecturer ample opportunities to refer to living exmples of very many of the maladies he describes, and to demonstrate the results of treatment.

CLINICAL MEDICINE.

PROFESSOR, JAMES STEWART.
ASSOCIATE PROFESSORS, F. G. FINLEY and H. A. LAFLEUR.
ASSISTANT PROFESSOR, C. F. MARTIN.

The instruction in Clinical Medicine is conducted in the theatres, wards, out-patient rooms and laboratories of the Royal Victoria and Montreal General Hospitals.

The courses include:—

I. The reporting of cases by every member of the Graduating Class, a certain number of beds being assigned to each student.

II. Bedside instruction for members of the Graduating Class.

III. Two Clinics weekly in each hospital.

IV. Tutorial instruction for the Junior Classes, in the wards and out-patient rooms of both hospitals.

V. Instruction in Clinical Chemistry and Bacteriology.

SURGERY.

PROFESSOR, THOMAS G. RODDICK.

LECTURERS, { *J. M. ELDER.* / *A. E. GARROW.*

This course consists of the Principles and Practice of Surgery and Surgical Pathology, illustrated by a large collection of preparations from the Museum, as well as by specimens obtained from cases under observation at the Hospitals. The greater part of the course, however, is devoted to the Practice of Surgery, in which attention is constantly drawn to cases which have been observed by the class during the session. The various surgical appliances are exhibited, and their uses and application explained. Surgical Anatomy and Operative Surgery form special departments of this course.

CLINICAL SURGERY.

PROFESSOR, JAMES BELL.

ASSOCIATE PROFESSOR, GEORGE E. ARMSTRONG.

LECTURERS, { *J. M. ELDER.* / *A. E. GARROW.* / *J. A. HUTCHISON.*

DEMONSTRATOR, KENNETH CAMERON.

The teaching in Clinical Surgery is conducted at the Montreal General and Royal Victoria Hospitals.

I. In the amphitheatre of each of these Hospitals, demonstrations are given and operations are performed before the senior and junior classes on alternate days.

II. Small ward classes of about ten men in each are taken through the wards by the surgeon in attendance, and in-

struction given at the bedside concerning the nature and management of surgical cases, in each hospital, at least once per week.

III. Beds are assigned to students in rotation, and each student is required to carefully study and report cases and to assist in the surgical dressing of the same. Certificates of case reporting are given, and are essential for graduation.

IV. In the Out-patient Department students have an exceptionally good opportunity to study a great variety of injuries, to witness operations in minor surgery, to come into personal contact with patients and to take part in the application of a variety of surgical dressings and appliances.

OBSTETRICS AND DISEASES OF INFANTS.

PROFESSOR, J. CHALMERS CAMERON.
LECTURER, D. J. EVANS.
ASSISTANT DEMONSTRATORS, { *T. P. SHAW.* / *JAMES BARCLAY.*

This course will embrace: (1) Lectures on the principles and practice of the obstetric art, illustrated by diagrams, fresh and preserved specimens, the artificial pelvis, complete sets of models illustrating deformities of the pelvis, wax preparations, bronze mechanical pelvis, etc. (2) Bedside instruction in the Montreal Maternity, including external palpitation, pelvimetry, the management and after-treatment of cases. (3) A complete course on obstetric operations with the phantom and peserved foetuses. (4) The diseases of infancy. (5) A course of individual clinical instruction at the Montreal Maternity.

Arrangements have now been made for a graded course in Obstetrics, instruction being given separately to third year and final students.

Particular attention is given to Clinical instruction, and a Clinical examination in Midwifery similar to that held in Medicine and Surgery now forms part of the final examination.

A short course of lectures on disease of infancy is given, supplemented by Clinical demonstration and ward work.

GYNÆCOLOGY.

PROFESSOR, WM. GARDNER.
LECTURER, F. A. M. LOCKHART.
DEMONSTRATOR, J. D. CAMERON.

The didactic course is graded, and consists of from forty to forty-five lectures given at intervals alternating with the lectures of Obstetrics and extending throughout the session. The anatomy and physiology of the organs and parts concerned is first discussed. Then the various methods of examination are fully described, the necessary instruments exhibited, and their uses explained.

The diseases peculiar to women are considered as fully as time permits, somewhat in the following order:—Disorders of Menstruation; Leucorrhoea; Diseases of the External Genital Organs; Inflammations, Lacerations and Displacements of the Uterus; Pelvic Cellulitis and Peritonitis and Inflammations of the Ovaries and Fallopian Tubes; Benign and Malignant growths of the Uterus; Tumors of the Ovary; Diseases of the Bladder and Urethra. The lectures are illustrated as fully as possible by drawings and morbid specimens.

Clinical teaching, including out-patient and bed-side instruction, is given at both Royal Victoria and Montreal General hospitals by Professor Gardner and Doctors Lockhart and Webster. A large amount of Clinical material is thus available for practical instruction in this department of medicine. Numerous operations are done before the class, and made the subject of remarks. In addition to the ward-patients, each hospital conducts a large out-patient Gyaecological Clinic, to which advanced students are admitted in rotation and instructed in digital and bi-manual examination and in the use of instruments for diagnosis.

Particular attention is thus given to Clinical instruction, and a Clinical examination in Gynaecology similar to that held in Medicine and Surgary now forms part of the final examination.

MEDICAL JURISPRUDENCE.

PROFESSOR, GEO. WILKINS.

This course includes Insanity, the subject being treated of in its Medical as well as Medico-Legal aspects. Special at-

tention is devoted to the subject of blood stains, the clinical microscopic and spectroscopic tests for which are fully described and shown to the class. The various spectra of blood in its different onditions are shown bythe Microspectroscope, so well adapted for showing the reactions with exceedingly minute quantities of suspected material. Recent researches in the diagnosis of human from animal blood are alluded to. In addition to the other subjects usually included in a course of this kind, Toxicology is taken up. The modes of action of poisons, general evidence of poisoning and classification of poisons are first treated of, after which the more common poisons are described, with reference to symptoms, post-mortem appearances and chemical tests. The post-mortem appearances are illustrated by plates, and the tests are shown to the class. A series of demonstrations and Clinics will be given by Prof. Johnston on the Medico-Legal cases arising out of the coroner's court, as well as those in the Montreal General Hospital. In this way Students will have practical clinical instruction in methods of Medico-Legal investigation in civil as well as in criminal cases.

OPHTHALMOLOGY AND OTOLOGY.

PROFESSOR, F, BULLER.

LECTURERS, { *J. J. GARDNER.* / *J. W. STIRLING.*

This will include a course of twenty-five lectures on diseases of the Eye and Ear, both didactic and clinical. In the former, the general principles of diagnosis and treatment will be dealt with, including three lectures on the errors of refraction and faults of accommodation. At the clinical lectures given in the Hospitals cases illustrative of the typical forms of ordinary diseases of the Eye and Ear will be exhibited and explained to the class. In the out-patients' department of each Hospital students have excellent opportunities of gaining clinical experience.

BIOLOGY.

D. P. PENHALLOW, PROFESSOR BOTANY.
E. W. MACBRIDE, " ZOOLOGY.

The course in elementary Biology is designed to prepare for special study in medical subjects. Under the supervision of the professors of Botany and Zoology it will be given during the autumn term—zoology first eight weeks; botany, last four weeks.

A.—Animal Biology.

The Course in Animal Biology will discuss the fundamental properties of protoplasm; the principles of the formation of tissues; the formation of organs; an outline of veretebrate structure and function, as exemplified by Paramecium and Vorticella, Hydra, Lumbricus and the Dog-fish.

Two lectures and one laboratory period each week.

B.—Plant Biology.

The Course in Plant Biology will deal chiefly with the general properties of cytoplasm; the structure and nature of the plant cell; movement; nutrition; respiration; fixation of carbon; division of labor and origin of organs; evolution of plant forms. These principles will be illustrated in their more simple forms by a Myxomycete, Pleurococcus, Spirogyra and Oedogonium, Fucus, Saccharomyces and Pteris.

Two lectures and one demonstration each week.

PATHOLOGY.

The SIR DONALD SMITH, PROFESSOR,—J. G. ADAMI.
LECTURER, A. G. NICHOLS.
DEMONSTRATORS, D. D. MACTAGGART, D. P. ANDERSON.
FELLOWS, W. W. FORD and J. McCRAE.

The following courses constitute the teaching on this subject:—

1. A course of General Pathology for Students of the Third Year (optional for those of the Fourth). Lectures are delivered twice weekly throughout the year.

2. A course of demonstrations in the performance of Autopsies for Students of the Third Year. The demonstrations are held once a week, from October until Christmas.

3. Demonstrations upon the Autopsies of the week for Students of the two final years. These are given during the session by Dr. Adami at the Royal Victoria Hospital, and by Dr. Wyatt Johnston at the General Hospital.

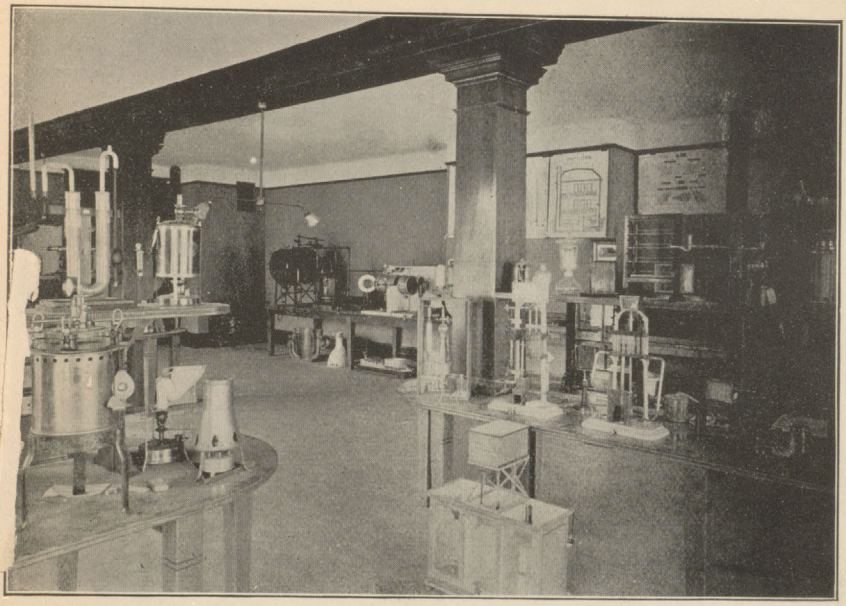
Practical Courses.

4. The performance of autopsies. Each student is required to take an active part in at least six autopsies. The autopsies are conducted at the General and Royal Victoria Hospitals by the Pathologists of the Hospitals and their assistants. In addition to the actual performance of the *sectio cadaveris*, students are expected to attend the practical instruction given in connection with each autopsy, in the method of preparation and microscopic examination of the removed tissues, so as to become proficient in methods of preparation, staining and mounting.

5. A practical course in Morbid Histology for Students of the Third Year. This class is held once a week during the winter months. Six sections are as a rule distributed at each meeting of the class so that each student obtains a large and representative series of morbid tissues, and upon an average twenty minutes are devoted to the description and examination of each specimen. Laboratory fee to cover cost of slides, reagents, microscope, etc., $5.

6. A course of demonstrations upon Morbid Anatomy (Museum specimens) once weekly during the winter months, for students of the Fourth Year.

In addition to the above the staff of the department give instruction to the more advanced students who desire to undertake any special work in the laboratories. Classes in clinical pathology and microscopy are given from time to time at the Pathological Laboratory and at the General and Royal Victoria Hospitals under the direction of the Professors of Clinical Medicine. In connection with this department, two researches and teaching fellowships have been established; one by the Faculty of Medicine and one by the Governors.



Medical Buildings.—Laboratory of Hygiene.

Medical Buildings.—Bacteriological Laboratory.

DEPARTMENT OF PUBLIC HEALTH AND PREVENTIVE MEDICINE.

The SIR DONALD SMITH PROFESSOR,—ROBT. CRAIK.

SANITATION AND PREVENTIVE MEDICINE, { *PROF. ROBT. CRAIK.* / *PROF. WYATT JOHNSTON.*

SANITARY CHEMISTRY, PROF. R. F. RUTTAN.

BACTERIOLOGY, PROF. J. G. ADAMI.

DEMONSTRATORS. { *H. B. YATES.* / *A. J. WILLIAMS.*

The Department of Public Health and Preventive Medicine has, owing to its endowment by Sir Donald A. Smith, been made one of the most important subjects of the third year.

The instruction will consist of two lectures per week for the whole session. A systematic course in Bacteriology and Preventive Medicine, including Serum Therapy, will be followed by courses on the sanitary relations of water, soil, food and air, the use and relative value of disinfectants, domestic sanitation, including plumbing, heating, ventilation, the construction of habitations, etc., and will be illustrated by models and special apparatus. Lectures will also be given on personal hygiene, including bathing, exercise, etc., and on climate and health resorts. In addition to the course of systematic lectures, laboratory courses will be given in the Pathological and Chemical laboratories on Bacteriology and sanitary Chemistry. The laboratory work will extend over a period of three months, and will be given twice weekly.

A working museum and model room is equipped with working models and apparatus to illustrate the application of hygienic principles. Demonstrations will be given in the hygienic museum from time to time as required. (See Museums.)

LARYNGOLOGY AND RHINOLOGY.

PROFESSOR, H. S. BIRKETT.

DEMONSTRATOR, H. D. HAMILTON.

This course will consist of practical lessons in the use of the Laryngoscope and Rhinoscope. The instruction will be

carried on with small classes, so that individual attention may be insured. A limited number of clinical lectures bearing upon interesting cases attending the clinic will be delivered during the session. These lectures will be, however, of an eminently practical nature.

MENTAL DISEASES.

PROFESSOR T. J. W. BURGESS.

This course will comprise a series of lectures at the University on Insanity in its various forms, from a medical as well as from a medico-legal standpoint. The various types of mental diseases will be illustrated by cases in the Verdun Asylum, where clinical instruction will be given to groups of senior students at intervals throughout the session.

DISEASES OF INFANTS AND CHILDREN.

PROFESSORS, *A. D. BLACKADER.*
J. C. CAMERON.

Although this subject does not constitute a special chair in the University, systematic instruction is given (*a*) in connection with the chair of Obstetrics and Diseases of Infants, by Prof. Cameron; (*b*) by a course of lectures, clinical and didactic by Prof. Blackader, and (*c*) through the Children's Clinic at the Montreal General Hospital and at the Infants' Home.

IV.

DOUBLE COURSES.

By special arrangements with the Faculty of Arts, it is now possible for students to obtain the double degree of B.A., and M.D., C.M., after only six years of study.

It has been decided to allow the Primary subjects (Anatomy, Physiology and Chemistry) in medicine to count as Honor subjects of the third and fourth years in Arts. It follows then that at the end of four years' study a student may obtain his B.A. degree and have two years of his medical course completed.

The remaining two years of study are devoted to the third and fourth year subjects in Medicine.

The special provisions for Medical Students in the Arts course are as follows:—

During the first two years in the Faculty of Arts students taking the double course will complete their studies in Biology, Physics and Elementary Chemistry.

I. *In the Third Year:*—

(*a*) Anatomy and Practical Anatomy, Histology and Physiology, of First Year Medicine.

(*b*) Either one or two of the courses which are not placed under the heading "Science" in the Arts curriculum.

(*c*) Either one or two hours weekly in English Composition.*

II. *In the Fourth Year:*—

(*a*) Anatomy and Practical Anatomy, Histology, Physiology, Chemistry, of Second Year Medicine.

(*b*) One of the courses which are not placed under the heading "Science" if only one has been taken in the Third Year.

(*c*) One hour weekly in English Composition, if only one has been taken in the Third Year.*

**NOTE.—Students are recommended to distribute their English work over two years.*

To secure these privileges, certificates of registration in the Medical Faculty must be presented at the beginning of each year to the Dean of the Faculty of Arts; and at the end of each session in the first two years certificates of attendance on lectures and of passing the corresponding examinations must also be presented. At the end of the Third and Fourth Years certificates must be presented to show that the full curriculum of the Medical Faculty for the year has been completed.

A certificate of Licentiate in Arts will be given along with the professional degree in Medicine to those who, previous to entrance upon their professional studies proper, have completed two years in the Faculty of Arts, and have duly passed the prescribed examinations therein.

V.

GRADUATE AND ADVANCED COURSES.

The Faculty of Medicine in 1896 established post-graduate and special courses in connection with the Montreal General and Royal Victoria Hospitals and the various laboratories in the University buildings. These courses will be continued in 1901.

There will be two distinct sets of courses, one a short practical and clinical course for medical men in general practice who desire to keep in touch with recent advances in Medicine, Surgery and Pathology, and who wish special clinical experience in Gynaecology, Ophthalmology, Laryngology, etc. This course will last about six weeks, beginning 'about the first of May.

A special detailed programme will be prepared, and will be sent on application in February next. The fee, including hospital fees for both hospitals, is fifty dollars.

The other courses will be for those who have just completed their regular course in Medicine, and desire special Laboratory or Clinical teaching before beginning practice.

Arrangements have also been made to accommodate a limited number of such graduates who desire advanced and research work.

Commodious laboratories for advanced work have been equipped in connection with the Pathological and Clinical departments of both the Royal Victoria and Montreal General Hospitals, and in connection with the general laboratories for Pathology, Pharmacology, Physiology and Chemistry, recently altered and extended in the new buildings of the Faculty.

Recent graduates of recognized universities desiring to qualify for examinations by advanced laboratory courses, or who wish to engage in special research, may enter at any time by giving a month's notice, stating the courses desired and the time at their disposal.

All the regular clinics and demonstrations of both hospitals

will be open to such students on the same conditions as undergradutes in medicine of this University.

These laboratories have been open for graduates since May 1st, 1896.

Further details regarding courses, fees, etc., may be obtained on application to the Registrar.

THE GRADUATE COURSE OF 1900.

The Faculty of Medicine has just completed the Fifth special course of instruction for general practitioners. This course began **Tuesday, May 2nd,** and closed **June 10, 1900.**

The course consisted of:—

(A.)—LABORATORY COURSES.—Systematic laboratory instruction was given from 9 to 10.30 every morning in Microscopical Methods, Clinical Microscopy and Clinical Bacteriology, including the histology of blood in disease and serum diagnosis. These courses were conducted by Profs. Adami and Wyatt Johnston, assisted by Drs. C. F. Martin, N. D. Gunn, Nichols, Anderson and Yates. A course of Operative Surgery on the cadaver was given by Prof. Armstrong from 8 to 9 a.m. during the second, third and fourth weeks of the course.

(B.)—LABORATORY AND SPECIAL DEMONSTRATIONS. — These demonstrations were given daily from 10.30 to mid-day, and consisted of one or more of the following: Modern treatment of Diphtheria, Prof. Finley; Operative Midwifery, Prof. J. C. Cameron; Mental Diseases, Dr. Burgess; Medico-Legal Autopsy Methods, Prof. Wyatt Johnston; Clinical use of Roentgen Rays, Prof. Girdwood; Illustrations of the Graphic ethod as applied to Physiology and Clinical Medicine, Prof. W. Mills; Anatomical Demonstration on the Cadaver, Drs. McCarthy and Tait McKenzie; Surgical Anatomy, Drs. Elder and J. Henderson; Clinical Chemistry and Urinalysis, Prof. Ruttan; Morbid Anatomy of certain diseases, Prof. Adami; Infant feeding (Modified Milk, etc.), Dr. Evans.

(C.) — MEDICAL AND SURGICAL CLINICS. — For four days each week, during the first two hours of the after-

noon, there were clinics on groups of cases in the wards of the Montreal General and Royal Victoria Hospitals. Those given in the Medical Wards of the Montreal General Hospital were given by Profs. Blackader and Lafleur; in the Surgical Wards, by Prof. Shepherd and Dr. Elder; in the Royal Victoria Hospital Medical Wards, by Prof. Stewart and Dr. C. F. Martin; in the Surgical Wards, by Prof. Bell and Dr. Garrow. In addition two or three ward classes were given weekly.

(D.)—CLINICS IN SPECIAL DEPARTMENTS OF MEDICINE AND SURGERY. — One or more of these clinics were given in the Hospitals each afternoon, after the regular Medical or Surgical Clinic, and during the entire afternoon on Wednesday and Saturday of each week. The following special Clinics were given: Ophthalmology in the Royal Victoria Hospital, by Prof. Buller; in the Montreal General Hospital, by Dr. J. Gardner; Dermatology, Prof. Shepherd; Genito-Urinary Surgery, Prof. Bell; Orthopedics, Dr. C. W. Wilson; Laryngology, Prof. Birkett and Dr. Hamilton; Gynaecology, Prof. Wm. Gardner and Dr. Chipman in the Royal Victoria Hospital, and Dr. Lockhart in the Montreal General Hospital; Aseptic Midwifery (at the Montreal Maternity Hospital), Prof. J. C. Cameron; Diseases of Children, Prof. Blackader and Dr. G. G. Campbell.

The above course of instruction is given wholly apart from the regular lectures, clinics, etc., for undergraduates in medicine, and the Graduates may enter on the course at any time between May 1st and June 15th.

Practitioners who purpose attending this course may obtain programme of course for 1901 on application after March next to the Registrar.

DIPLOMA COURSE IN PUBLIC HEALTH.

The Faculty of Medicine in the session of 1899-1900 instituted a graduate course in Public Health and Sanitary Science. This course will be given each year and the diplomas conferred at the annual convocation.

Candidates undertaking this Course must have possessed a degree in Medicine or other qualification of practice for at least twelve months before the candidate is competent to re-

ceive the diploma. The following are the courses resquisite:

1. Course of lectures in Public Health (to be omitted in the case of candidates who have attended such a course before graduation).

2. A three months' course of instruction upon infective and parasitic diseases of man and the domestic animals, which course shall include practical work in a bacteriological laboratory.

3. A six months' course of practical study of outdoor sanitary work under a medical officer of health (to be omitted in the case of medical health officers holding appointments prior to the establishment of this diploma course).

4. Three months' attendance and clinical instruction at a hospital for infectious diseases (unless such course has already been taken prior to graduation).

5. Three months' instruction in sanitary chemistry and physics with practical work in a chemical laboratory.

Examination for Diploma shall cover the following subjects:—

1. Examination of clinical cases at an infectious hospital.

2. The drawing up of outlines for annual and other reports of officers of health.

3. Report upon the sanitary condition of some actual locality.

4. The chemical analysis of liquids and gases and of specimens of food.

5. Demonstration of the consideration and use of meteorological hygienic and sanitary apparatus.

6. Microscopical examination of specimens submitted.

7. Description of specimens of human and other diseased tissues.

8. Practical examination in the employment of the usual bacteriological methods.

9. The inspection of carcases of animals to be used for food.

The above examination shall be written and oral and practical, and shall extend over a period of four days.

The following is a list of subjects included in the curriculum of study:—

(*a*) *Sanitary Chemistry*, examination of air, gases, water, the

action of water on metals, milk and food; detection of poisons in articles of dress and of decoration; the chemistry of sewage.

(*b*) *Sanitary Physics:* Hydrodynamics, pneumatics and hydraulics applied to hygiene, light and photometry; heat and thermometry; the principles of hygrometry.

(*c*) *Sanitary Legislation:* Statutes and by-laws relating to public health; the powers of public sanitary authorities.

(*d*) *Bacteriology and Parasitology:* Modes of propagation of disease and transmission of disease between man and man, and man and animals; bacteriological analysis in relation to public health matters; natural history of microbes and animal parasites.

(*e*) *Vital Statistics:* Calculation and tabulation of returns of births, marriages, and deaths and diseases.

(*f*) *Nosology:* Definition in nomenclature and classification of disease.

(*g*) *Meteorology and Climatology:* The geographical and topographical distribution of disease.

(*h*) *Preventive Medicine and Practical Sanitation.*

The fee for the Diploma of the first session shall be $10.

VI.

QUALIFICATIONS FOR THE DEGREE.*

1st. No one entering after September, 1894, will be admitted to the Degree of Doctor of Medicine and Master of Surgery who shall not have attended Lectures for a period of four nine months' sessions in this University, or some other University, College or School of Medicine, approved of by this University.

2nd. Students of other Universities so approved and admitted on production of certificate to a like standing in this University shall be required to pass all Examinations in Primary and Final Subjects in the same manner as Students of this University.

3rd. Graduates in Arts who have taken two full courses in General Chemistry, including Laboratory work, two courses in Biology, including the subjects of Botany, Embryology, Elementary Physiology and dissection of one or more types of Vertebrata, may, at the discretion of the Faculty, be admitted as second-year Students, such courses being accepted as equivalent to the first-year in Medicine. Students so entering will, however, not be allowed to present themselves for examination in Anatomy until they produce certificates of dissection for two sessions.

4th. Candidates for Final Examination shall furnish Testimonials of attendance on the following branches of Medical Education. ‡ viz:

ANATOMY. PRACTICAL ANATOMY. PHYSIOLOGY. CHEMISTRY. PHARMACOLOGY AND THERAPEUTICS. PRINCIPLES AND PRACTICE OF SURGERY. OBSTETRICS AND DISEASES OF INFANTS. GYNÆCOLOGY. THEORY AND PRACTICE OF MEDICINE. CLINICAL MEDICINE. CLINICAL SURGERY.	Of which Two full Courses will be required.
MEDICAL JURISPRUDENCE. GENERAL PATHOLOGY. HYGIENE AND PUBLIC HEALTH. PRACTICAL CHEMISTRY. OPHTHALMOLOGY AND OTOLOGY.	Of which One full Course will be required.
BIOLOGY. HISTOLOGY. PATHOLOGICAL ANATOMY. BACTERIOLOGY. MENTAL DISEASES. PEDIATRICS. MEDICAL AND SURGICAL ANATOMY.	Of which One Course will be required.†

* *It shall be understood that the programme and regulations regarding courses of study and examinations contained in this calendar hold good for this calendar year only, and that the Faculty of Medicine, while fully sensible of its obligations towards the students, does not hold itself bound to adhere absolutely, for the whole four years of a student's course, to the conditions now laid down.*

† Students enregistered in the Province of Quebec are required to attend and pass examinations in Laryngology and Minor Surgery.

‡ Provided, however, that Testimonials equivalent to, though not precisely the same as those above stated, may be presented and accepted.

He must also produce Certificates of having assisted at six Autopsies, of having dispensed Medicine for a period of three months, and of having assisted at twenty Vaccinations.

5th. Courses of less length than the above will only be received for the time over which they have extended.

6th. No one will be permitted to become a Candidate for the degree who shall not have attended at least one full Session at this University.

7th. The Candidates must give proof of having attended during at least twenty-four months the practice of the Montreal General Hospital or the Royal Victoria Hospital or of some other Hospital of not fewer than 100 beds, approved of by this University. Undergraduates are required to attend only the practice of the Out-Patient departments of the Hospitals during their second year.

8th. He must give proof of having acted as Clinical Clerk for six months in Medicine and six months in Surgery in the wards of a general hospital recognized by the Faculty, of having reported at least 10 medical and 10 surgical cases.

9th. He must also give proof by ticket of having attended for at least nine months the practice of the Montreal Maternity or other lying-in-hospital approved of by the University, and of having attended at least six cases.

10th. Every candidate for the degree must, on or before the 15th day of May, present to the Registrar of the Medical Faculty testimonials of his qualifications, entitling him to an examination, and must at the same time deliver to the Registrar of the Faculty an affirmation or affidavit that he has attained the age of twenty-one years.

11. The trials to be undergone by the Candidate shall be in the subjects mentioned in Section 4.

12. The following oath of affirmation will be exacted from the Candidate before receiving his degree:

SPONSIO ACADEMICA.

In Facultate Medicinæ Universitatis.

Ego, A——B——, Doctoratus in Arte Medica titulo jam donandus, sancto coram Deo cordium scrutatore, spondeo:—me in omnibus grati animi officiis erga hanc Universitatem ad extremum vitæ halitum perseveraturum; tum poro artem medicam caute, caste, et probe exercit·turum; et quoad in me est, omnia ad ægrotorum corporum salutem corducentia cum fide procu·aturum; quæ denique, inter medendum, visa vel audita silere conveniat, non sine gravi causa vulgaturum. Ita praesens mihi spondenti adsit Numen.

13th. The fee for the Degree of Doctor of Medicine and Master of Surgery shall be thirty dollars, to be paid by the successful candidate immediately after examination.

VII.

EXAMINATIONS.

Frequent oral examinations are held to test the progress of the Student, and occasional written examinations are given throughout the Session.

The PASS AND HONOR examinations at the close of each Session are arranged as follows:—

First Year.

Examinations in BIOLOGY, HISTOLOGY, PHYSIOLOGY, ANATOMY, CHEMISTRY Theoretical and Practical.

Students who have taken one or more university courses in Botany or Chemistry before entering may be exempted from attendance and examination. Students exempted in their first year subjects are allowed only a pass standing, but may present themselves for examination if they desire to attain an honor standing.

Second Year.

Examinations in ANATOMY, CHEMISTRY, PRACTICAL CHEMPEUTICS.

Third Year.

Examinations in PHARMACOLOGY and THERAPEUTICS, MEISTRY, PHYSIOLOGY, HISTOLOGY, PHARMACOLOGY and THERADICAL JURISPRUDENCE, PUBLIC HEALTH and PREVENTIVE MEDICINE (including BACTERIOLOGY), GENERAL PATHOLOGY, MENTAL DISEASES, CLINICAL CHEMISTRY, OBSTETRICS, MEDICINE and SURGERY.

Fourth Year.

Examinations in MEDICINE, SURGERY, OBSTETRICS, GYNÆCOLOGY, OPTHALMOLOGY, CLINICAL MEDICINE, CLINICAL SURGERY, CLINICAL OBSTETRICS, CLINICAL GYNÆCOLOGY, CLINICAL OPTHALMOLOGY and PRACTICAL PATHOLOGY.

By means of the above arrangement a certain definite amount of work must be accomplished by the student in each

year, and an equitable division is made between the Primary and Final branches.

A minimum of 50 *per cent. in each subject is required to Pass and* 75 *per cent. for honors.*

Candidates must pass in all the subjects of each year; those who fail to pass in not more than two subjects of either the first, second or third years may be granted a supplemental examination at the beginning of the following session.

Supplemental examinations will not be granted, except by special permission of the Medical Faculty, and on written application stating reasons, and accompanied by a fee of $5.00 for each subject.

No candidate will be permitted, without special permission of the Faculty, to proceed with the work of the final year until he has passed all the subjects comprised in the Primary examination.

No Student will be allowed to present himself for his final examinations who has not certificates of having passed all his Primary examinations in this University.

Candidates who fail to pass in a subject of which practical courses are required may, at the discretion of the Faculty, be required to repeat the course, and furnish a certificate of attendance thereon. A course in Practical Anatomy will be accepted as equivalent to a third course of lectures in General and Descriptive Anatomy.

VIII.

FELLOWSHIPS, MEDALS AND PRIZES.

The Faculty has begun to establish Teaching and Research Fellowships in connection with the various laboratories.

These fellowships are of a value of five hundred dollars per annum, and are tenable for three years.

Two are now established in connection with the department of Pathology—a Governor's Fellowship endowed by one or two of the Governors of the University, and a Faculty Fellowship established by the Faculty. Other Fellowships will be announced as they are established.

1st. The "HOLMES GOLD MEDAL," founded by the

Medical Faculty in the year 1865, as a memorial of the late Andrew Holmes, Esq., M.D., LL.D., late Dean of the Faculty of Medicine. It is awarded to the student of the graduating class who receives the highest aggregate number of marks in the different branches comprised in the Medical Curriculum.

The Student who gains the Holmes' Medal has the option of exchanging it for a Bronze Medal, and the money equivalent of the Gold Medal.

2nd. THE FINAL PRIZE.—A Prize in Books (or a Microscope of equivalent value) awarded for the best examination, written and oral, in the Final branches. The Holmes' medalist is not permitted to compete for this prize.

3rd. THE THIRD YEAR PRIZE.—A Prize in Books awarded for the best examination, written and oral, in the branches of the third year.

4th. THE SECOND YEAR PRIZE.—A prize in books for the best examination in all the branches of the second year in course.

5th. THE FIRST YEAR PRIZE.—A prize in books for the best examination in all the branches of the first year in course.

6th. The "SUTHERLAND GOLD MEDAL," founded in 1878 by the late Mrs. Sutherland in memory of her late husband, Professor William Sutherland, M.D. It is awarded for the best examination in General and Medical Chemistry, together with creditable examination in the primary branches. The examination is held at the end of the third year.

7th. The "CLEMESHA PRIZE IN CLINICAL THERAPEUTICS," founded in 1889 by John W. Clemesha, M.D., of Port Hope, Ont. It is awarded to the student making the highest marks in a special clinical examination.

IX.

FEES.

The total Faculty Fees for the whole medical course of four full sessions, including clinics, laboratory work, dissecting material and reagents, will be *five hundred dollars*, payable in four annual instalments of $125 each.

For the convenience of the undergraduates, the Hospital fees are payable in the Registrar's office at the University. Ten dollars to be paid at the beginning of each of the last three sessions, viz., the second, third and fourth years. This will entitle each undergraduate to perpetual tickets for both the Montreal General and Royal Victoria Hospitals.

Partial students will be admitted to one or more courses on payment of special fees. An annual University fee of three dollars is charged students of all the faculties for the maintenance of college grounds and athletics.

Students repeating the course of study of any Academic session are not required to pay full fees. A fee of twenty-five dollars will be charged, which will include Hospitals, dissecting material, chemical reagents, laboratory fees, etc. The same fee is charged students entering from other colleges who have already paid elsewhere fees for the courses taken.

It is suggested to parents or guardians of students that the fees be transmitted direct by cheque or P. O. Order to the Registrar, who will furnish official receipts.

All fees are payable in advance to the Registrar, and except by permission of the Faculty will not be received later than October 20th.

For Graduation Fees, see page 252.

For Hospital Fees, see pages 266, 267, 270.

X.

TEXT BOOKS.

ANATOMY.—Gray, Morris, Quain (Eng. Ed.), Gervish.

PRACTICAL ANATOMY.—Cunningham's Practical Anatomy, Ellis' Demonstrations, Holden's Dissector and Landmarks.

PHYSICS.—Balfour Stewart.

INORGANIC CHEMISTRY.—Remsen, Wurtz's Elementary Chemistry.

ORGANIC CHEMISTRY.—Remsen.

PRACTICAL CHEMISTRY.—Odling.

PHARMACOLOGY and THERAPEUTICS.—Butler, White, Hare and Wood.

PHYSIOLOGY.—Foster and Shore's Physiology for Beginners, Mills' Textbook of Animal Physiology, Foster's Physiology, G. N. Stewart's Physiology, Mills' Class Laboratory Exercises.

PATHOLOGY.—Zeigler, Coats'.

PRACTICAL PATHOLOGY.—Mallory and Wright, Delafield & Prudden, Boyce.

BACTERIOLOGY.—Muir & Ritchie, Abbott.

HISTOLOGY.—Klein's Elements, Schafer's Essentials of Histology, Stohr.

SURGERY.—Holmes, Moullin, Walsham, Erichsen, Treves, American Text-Book of Surgery, Da Costa.

PRACTICE OF MEDICINE.—Osler, Tyson, Wood and Fitz.

CLINICAL MEDICINE.—Musser's Medical Diagnosis; Simon, Klemperer, Rainy and Hutchison, Vierort's Medical Diagnosis.

MEDICAL JURISPRUDENCE.—Reese, Guy and Ferrier.

MENTAL DISEASES.—Insanity and its Treatment, Blandford, 4th Ed.

OBSTETRICS.—Jewett, and American Text Book.

DISEASES OF CHILDREN.—Holt, Rotch, Smith and Starr.

GYNÆCOLOGY.—Hart and Barbour, Garrigues, Webster, Dudley on Diseases of Women.

HYGIENE.—Parks, Wilson, Rohe.

BIOLOGY, BOTANY.—Gray's Text Book of Histology and Physiology; ZOOLOGY, Shipley and Macbrides' Introduction to Zoology.*

OPTHALMOLOGY.—De Schweinitz, Nettleship and Swanzy.

OTOLOGY.—Pritchard, Dalby.

LARYNGOLOGY.—Watson Williams and Karl Seiler, Grumwald's Atlas of Diseases of Larynx.

OPERATIVE SURGERY.—Jacobson, Treves, Kocher.

DERMATOLOGY.—Malcolm Morris, Hyde, Crocker, Unna.

MEDICAL DICTIONARY.—Gould, Dunglison, Hoblyn.

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* Each student will be required to pay $2.50 in order to cover the cost of a class book and other necessaries which are supplied to him and become his property.

XI.

MUSEUMS.

The Faculty has during recent years devoted special attention to the development of its museums in the several departments in which objective teaching is of especial value in the education of the student.

There are now four museums in the Medical Building: (1) the Museum of Pathology, (2) the Anatomical Museum, (3) the Museum of Public Health and Preventive Medicine, (4) the Museum of Pharmacy.

Each collection is arranged and selected with the primary object of making it a teaching museum. The several collections are open to students and the public between 9 a.m. and 5 p.m.

PATHOLOGICAL MUSEUM.

PROF. J. G. ADAMI, DIRECTOR.
MAUD E. ABBOTT, B.A., M.D., ASSISTANT CURATOR.
M. JULES BAILLY, OSTEOLOGIST AND ARTICULATOR.

For the past fifty years the rich Pathological Material furnished by the Montreal General Hospital has been collected here. The Faculty is also greatly indebted to many medical men throughout Canada and different parts of the world for important contributions to the Museum.

During the past few years, numerous and extremely important additions have been made to the Medical Museum.

It is particularly rich in specimens of Aneurisms. In addition to containing a large number of the more common varieties of these formations, there are specimens of such rare conditions as Aneurism of the Hepatic and Superior Mesentric Arteries, Traumatic Aneurism of the Vertebral, together with several of the cerebral and pulmonary arteries. The most important collection probably in existence of hearts affected with "Malignant Endocarditis" is also found. The Faculty are indebted to Prof. Osler, late of this University, for this collection.

The Museum contains also a very large collection of different forms of calculi. The Faculty are mainly indebted to Prof. Fenwick for this collection

During the past seven years, M. Bailly, osteologist and articulator (lately with Tramond of Paris), has been engaged in arranging and mounting the very large number of specimens of disease and injuries of bones which have been accumulating for years. In this collection are to be found examples of fractures and dislocations of the spine, osteoporosis, congenital dislocation of the hip, fracture of the astragalus, multiple exostoses, etc., etc.

The Pathological Museum has recently undergone complete alteration. All the old fixtures have been removed, a new gallery has been erected about both rooms, reached by a single staircase in a small intermediate room in which is placed the medico-legal collection.

The first room on entering contains the extensive bone collection and calculi. The second and larger room is reserved for the moist preparations, which are arranged so as to be of easy access for the student. Water color drawings made from the fresh specimens are mounted on swinging frames, and also form a frieze at the ceiling. These serve to recall the fugitive colors of those preparations which become more or less altered on keeping.

Numerous specimens have been contributed from the surgical and medical wings of the Royal Victoria Hospital, and from the different departments of the Montreal General Hospital.

MUSEUM OF PUBLIC HEALTH AND PREVENTIVE MEDICINE.

DIRECTOR, R. F. RUTTAN.
MUSEUM ASSISTANT, CHARLES STEVENSON.

This Museum has been established from the interest accruing through the endowment of the Chair of Hygiene by Lord Strathcona and Mount Royal in 1893.

The museum at present is chiefly of interest on account of the number and excellence of the working models, illustrating

the best modern methods of stertilisation, disinfection, filtration and ventilation, together with a very useful collection of modern sanitary apparatus, illustrating the advantages and disadvantages of the water carriage system for the disposal of refuse, etc.

The Director has much pleasure in acknowledging contributions of value from:

1. The Sanitary Construction Company of New York.
2. Richard King, King, Sprague & Co., New York.
3. Maignens Filtre Rapide Co., London, Eng.
4. L. Casella, London, Eng.
5. Messrs. Doulton & Co., Lambeth Pottery, London, E.C.
6. The Sanitary Institue, Parke's Museum, London.
7. The Hygienic Referendum, Hornsey, London, Eng.
8. Messrs. Newton & Co., London.
9. The Expanded Metal Co., London.
10. A. B. Reck, Copenhagen, Denmark.
11. Fischer Filter Plate Co.
12. J. W. Hughes, Montreal.
13. Wormser, Filterplatten-Werk, Worms, Germany.
14. The Laing Packing Company, Montreal.

The Department of Hygiene is also indebted to Mr. Fleming, Sanitary Engineer, for assistance and advice.

ANATOMICAL MUSEUM.

DIRECTOR, PROFESSOR F. J. SHEPHERD.
M. JULES BAILLY, OSTEOLOGIST AND ARTICULATOR.

This Museum occupies a large room on the same floor and adjoining the Anatomy Lecture Room and Dissecting Room. Smaller apartments in connection are used for private research, which is encouraged in every way by the Faculty.

The Museum is well furnished and comfortable, and students have every opportunity of studying Human, Comparative and Applied Anatomy.

This department has during the past few years added a very complete collection of plaster and papier mache models by Steger, after the well-known works of His and Braune, comprising:

(*a*) A complete set of Steger's brain sections.

(*b*) Models of the cerebro-spinal and sympathetic nervous systems.

(*c*) Professor Cunningham's well-known and beautiful casts of the head, showing the relation of the cerebral convolutions to the skull and its sutures.

A large collection of human brains, made by Professor Osler, formerly of this University, exhibiting the various types and extremes.

A large and rare collection of anomalies of the Renal vessels and ureter, and the aorta and its branches.

In Comparative Anatomy the student will find a fair amount of material, the study of which will greatly aid him in the elucidation of many points in Human Anatomy.

Many skeletons mounted by Mons. Jules Bailly, Articulator to the University, representing the various classes, orders, genera and species of the animal kingdom may be consulted.

A large collection, showing the pectoral girdle in birds, has been prepared under the supervision of the Professor of Anatomy.

Moist and dry preparations of dissections, a large collection of frozen cross sections of the human body, showing the normal relations of the viscera, etc., will be found convenient for study.

During the past year numerous valuable specimens have been presented to the Museum and its stores, which will be acknowledged in the next Calendar.

XII.

LIBRARY.

LIBRARIAN, PROF. F. G. FINLEY.
ASSISTANT LIBRARIAN, Miss M. R. CHARLTON.

The Library of the Medical Faculty now comprises upwards of twenty-one thousand volumes, the largest special library connected with a medical school on this continent.

The valuable libraries of the late Professors Robert Palmer

Howard, George Ross, Richard L. MacDonnell, T. Johnston Alloway and of Dr. Allen Ruttan have been donated to the Medical Faculty.

The standard text-books and works of reference, together with complete files of the leading periodicals, are on the shelves. Students may consult any work of reference in the library between 9 a.m. and 6 p.m. A library reading-room for the use of students is provided.

Extracts from the Library Regulations.

I. During the College Session the Library is open daily (except Sundays and general public holidays) from 9 a.m. till 6 p.m. During vacation from 10 a.m. to 5 p.m.

II. The stack room is not open to students or to the public.

III. The books in the Library are classed in two divisions: 1st, those which may be taken from the Library; 2nd, those which may not, under any circumstances, be removed from the Library. The latter class includes all catalogues, dictionaries and encyclopedias.

IV. Students will be allowed to use regular text-books only in the Library. Any other book may be taken out at 5.30 p.m., to be returned the next day. If books so removed from the Library are not returned punctually, a fine will be imposed, and if the delay be serious the student may be suspended from use use of the Library at the discretion of the Librarian.

V. Students may take out books, subject to the above regulations, to the number of three volumes at one time.

VI. Books may be taken from the Library only after they have been especially asked for and charged at the delivery desk; borrowers who cannot attend personally must sign and date an order, giving the titles of the books desired and the name of the person deputed to procure the same.

VII. Damage to or loss of books shall be made good to the satisfaction of the Librarian and of the Library Committee. Writing or making any mark upon any book belonging to the Library is unconditionally forbidden. Any persons found guilty of wilfully damaging any book in any way shall be excluded from the Library, and shall be debarred from the use thereof for such time as the Library Committee may determine.

In the Medical Library.

VIII. Silence must be strictly observed in the Library.

IX. Infringement of any of the rules of the Library will subject the offender to a fine or suspension of his privileges, or to such other penalty as the nature of the case may require.

The number of volumes presented to the Library from June 4th, 1898, to May 25th, 1899, is	850
Those added by purchase	130
Total additions to May 25th	980
The number of pamphlets and reports	200
The attendance of readers from June 4th, 1898, to May 25th, 1899, has been	8,008
The attendance from June 2nd, 1897, to May 14th, 1898, was	6,350
The attendance from June 1st, 1896, to June 1st, 1897, was	5,920
The attendance from June 1st, 1895, to June 1st, 1896, was	4,875
The number of books taken out for home use has been	3,209
The number of Journals and pamphlets has been	1,000
	4,209

This does not include the works consulted in the Library.

The Faculty has endeavored to make the Library as complete as possible for research work. Complete files of almost all the important periodicals are now on the shelves, including foreign as well as English and American journals. A large number of transactions of various societies has recently been acquired, and also the Berlin and Paris theses.

Arrangements have been made whereby practitioners both in the city and country can avail themselves of the library, the only conditions being the payment of express charges and a guarantee for the safe return of books borrowed.

XIII.

McGILL MEDICAL SOCIETY.

This Society, composed of enregistered Students of the Faculty, meets every alternate Saturday during the Autumn and Winter Terms, for the reading of papers, case reports and discussions on medical subjects. A prize competition has been established in senior and junior subjects, the senior being open to all to write upon, while only the 1st, 2nd and 3rd year students are allowed to compete in the junior subjects. The papers are examined by a board elected from the Professoriate, and a first and second prize in each division of subjects is awarded to the successful candidates.

Names of competitors and titles of papers shall be sent to the Chairman of the Programme Committee before September 1st, and all papers shall be subject to the call of the Committee on October 1st. All papers shall be handed in for examination on or before January 10th.

The Students' reading room has been placed under the control of this Society, in which the leading English and American Medical Journals are on file, as well as the leading daily and weekly newspapers of the Dominion.

The annual meeting is held the first week of the Spring Term, when the following officers are elected: Hon. President, elected from the Faculty; President, Vice-President, Secretary, Assistant Secretary, Treasurer, Reporter, Pathologist, and three Councilmen (of whom two shall be elected from the Faculty).

XV.

HOSPITALS.

The City of Montreal is celebrated for the number and importance of its public charities. Among these its public hospitals are the most prominent and widely known. Those in which medical students of McGill University will receive clinical instruction are: (1) The Montreal General Hospital. (2) The Royal Victoria Hospital. (3) Montreal Maternity Hospital.

The Montreal General Hospital has for many years been the most extensive clinical field in Canada. The old buildings, having proved inadequate to meet the increased demand for hospital accommodation, have recently been increased by the addition of two surgical pavilions, the Campbell Memorial, and the Greenshields Memorial, and of a new surgical theatre. The interior of the older buildings now has been entirely reconstructed on the most approved modern plans.

The Royal Victoria Hospital at the head of University Street, which in structure and arrangements ranks among the finest modern hospitals of either continent, was opened for the reception of patients the first of January, 1894, and affords exceptional opportunities for clinical instruction and practical training.

Montreal General Hospital.

This hospital has been for many years the most extensive clinical field in Canada.

It consists of a Surgical and Medical Department.

The Surgical Department has two large pavilions, containing four wards 135 feet long by 35 broad, with an intervening and connecting building in which is a large operating theatre of the most modern type, capable of seating over 350 students. In connection with this are preparation, etherising, instruments, stertilising and surgeons' rooms, also smaller operating rooms. The Surgical pavilions, which were built three years ago, accommodate over one hundred patients.

The old part of the hospital, consisting of the Reed, Richardson and Morland wings, has during the past year been completely rebuilt and remodeled, and forms the Medical Department. This part contains four wards, 100 feet by 40, and is arranged for 150 beds. In this building there are wards for Gynaecological and Opthalmological patients, a number of private wards and laboratories for Clinical Chemistry. There is also a medical amphitheatre capable of seating 150 students and a gynaecological operating room fitted up in the most modern manner. The central part of the old building is for administration purposes.

A completely new and commodious out-door patient department has been provided on the ground floor of the Richardson wing, and there is ample accommodation for the various special departments as well as large rooms for general medical and surgical patients.

The Pathological Department is a completely new building in which are the post-mortem theatre and rooms for microscopical and bacteriological work, and also a mortuary and chapel. In this building students are offered every opportunity of perfecting their knowledge of morbid anatomy and pathological histology.

The old Fever Wards on the grounds of the Hospital have been completely remodeled, and are now used as a laundry and kitchen.

A much larger number of patients receive treatment in the Montreal General Hospital than in any other Canadian Hospital. Last year's report shows that between two and three thousand Medical and Surgical cases were treated in the wards, and the great proportion of these were acute cases, as may be gathered from the fact that the average duration of residence was only 24.02 days. Upwards of thirty-two thousand patients are annually treated in the out-door department of this Hospital.

Annual tickets entitling students to admission to the Hospital must be taken out at the commencement of the session, price $5.00. These are obtained at the College. Perpetual tickets will be given on payment of the third annual fee.

The Royal Victoria Hospital.*

This Hospital is situated a short distance above the University Grounds on the side of the Mountain, and overlooks the city. It was founded in July, 1887, by the munificence of Lord Mount Stephen and Sir Donald Smith, who gave half a million dollars each for this purpose.

The buildings, which were opened for the reception of patients on the first of January, 1894, were designed by Mr. Saxon Snell of London, England, to accommodate between 250 and 300 patients.

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* Fees for this hospital are the same as those for the Montreal General Hospital.

The Hospital is composed of three main buildings connected together by stone bridges; an Administration Block in the centre and a wing on the east side for medical patients, in immediate connection with which is the Pathological wing and mortuary, and a wing on the west side for surgical patients.

The Administration block contains ample accommodation for the resident medical staff, the nursing staff and domestics. The patients' entrance, the dispensary and admission rooms are also situated in this building. To the north of the Administration block has been erected a large out-patients' department, in which are special departments for Minor Surgery, Ophthalmology, Laryngology, and Gynaecology. This wing was opened for patients during the winter of 1899-1900.

The Medical wing contains three large wards, each 123 feet long by 26 feet 6 inches wide, one ward 40 feet by 26 feet 6 inches, and fifteen private and isolation wards averaging 16 feet by 12 feet. also a medical theatre with a seating capacity for 250, and three rooms adjacent to it for clinical chemistry and other purposes. North of this wing and in direct connection with it are the Pathological laboratories and mortuary.

In this wing are situated the mortuary proper, the chapel, a post mortem room capable of accommodating 200 students, and laboratories for the microscopic and bacteriological study of morbid tissues, some designed for the use of students and others for post graduation courses and special research. Special laboratories for Pathological Chemistry, Experimental Pathology, Bacteriology and Photography are also provided.

The Surgical wing contains three large wards, each 123 feet long by 26 feet 6 inches wide, four wards each 40 feet by 32 feet, and seven private and isolation wards, averaging 16 feet by 12 feet; also a surgical theatre with a seating capacity for 250, with six rooms adjacent for preparations and after recovery purposes.

In this wing are also the wards for Gynaecology and Ophthalmology.

XVI.

CLINICAL INSTRUCTION.

During the Session of 1899-00, three Medical, three Surgical, two Gynaecological and two Ophthalmological clinics will be held weekly in both the Montreal General and Royal Victoria Hospitals.

In addition, tutorial instruction will be given in these different departments in the wards, out-patient rooms and laboratories. Special weekly clinics will be given in the Montreal General Hospital on Dermatology and Laryngology and in the Royal Victoria Hospital on diseases of the Genito-Urinary system, and Laryngology.

CLINICAL CLERKS in the medical and surgical wards of both Hospitals are appointed every three months, and each one during his term of service conducts, under the immediate directions of the Clinical Professors, the reporting of all cases in the ward allotted to him. Students entering on and after October, 1893, will be required to show a certificate of having acted for six months as clinical clerk in medicine and six months in surgery, and are required to have reported at least ten cases in medicine and ten in surgery. The instruction obtained as clinical clerk is found to be of the greatest possible advantage to Students, as affording a true *practical* training for his future professional life.

DRESSERS are also appointed to the Out-door Departments. For these appointments, application is to be made to the Assistant Surgeons, or to the resident surgeon in charge of the out-patient department.

The large number of patients affected with diseases of the eye and ear, now attending the special clinics at both hospi-
miliar with all the ordinary affections of those organs, and to
miliar with all the ordinary affections of these organs, and to make themselves proficient in the use of the ophthalmoscope, and it is hoped that every student will thus seek to gain a practical knowledge of this important branch of Medicine and

Surgery. Operations are performed on the eye by the Ophthalmic Surgeons after the outdoor patients have been seen, and Students are invited to attend the same, and as far as practicable to keep such cases under observation so long as they remain in the Hospital.

There are also special departments in both Hospitals for Gynaecology and Laryngology, presided over by Specialists in these branches. Students are thus enabled to acquire special technical knowledge under skilled direction. The plan of teaching practical gynaecology for the past five years with marked success has been the limitation of the number of Stu-

The Clinics at the Montreal General Hospital in Dermatology and Laryngology are very large, and afford a practical training in affections of the skin and throat rarely obtained by medical students.

A special clinic for diseases of the Genito-Urinary Organs has been established at the Royal Victoria Hospital.

Infectious diseases and Insanity will also be taught clinically, the former in the special wards for infectious diseases and the latter at the Verdun Hospital for the Insane.

The Montreal Maternity.

The Faculty has great pleasure in announcing that the Corporation of the Montreal Maternity has made very important additions to its building, and has in contemplation the erection of a large new building, fitted with the most modern appliances. Students will therefore have greatly increased facilities for obtaining a practical knowledge of obstetrics and diseases of infancy. An improved Tarnier-Budin phantom is provided for the use of the students, and every facility afforded for acquiring a practical knowledge of the various obstetric manipulations. The institution is under the direct supervision of the Professor of Midwifery, who devotes much time and attention to individual instruction. Students who have attended the course on obstetrics during the autumn and winter terms of the third year will be furnished with cases in rotation, which they will be required to report and attend till convalescence. Clinical midwifery has been placed upon the same basis as Clinical Medicine and Surgery, and

a final Clinical examination instituted. Regular courses of clinical lectures are given throughout the session, special attention being paid to the important subject of infant feeding. The Walker-Gordon process of modifying milk is explained and demonstrated. During the autumn and winter terms the Demonstrator of Obstetrics gives Clinical Demonstrations in the wards and instruction in operative work on the phantom. Students will find it very much to their advantage to pay special attention to their Clinical work during the spring term of the third year and the following summer. One resident medical officer is appointed yearly from the graduating class to hold office for a period of six months.

Fee for twelve months, $12, payable at the Maternity Hospital.

University Library.—Main Reading Room.

Redpath Museum.—Interior View.

Faculty of Comparative Medicine and Veterinary Science.

SESSION 1900–1901.

The tenth Session of the Faculty (being the thirty-fifth of the Montreal Veterinary College) will be opened on Saturday, 22nd September, 1900. The regular course of lectures will begin on September, 24th, at the hours named in the time table, and will continue till the end of March. The hours of lectures will be announced later, together with the alterations which may be necessary, the course as herein announced being subject to such changes as the Faculty may see fit to make.

The Montreal Veterinary College was inaugurated in 1866.

The complete course of study in this Faculty extends over three years. Graduates of recognized Medical Colleges are allowed to present themselves for examination after regular attendance on one full course; graduates of recognized Agricultural Colleges in which Veterinary Science constitutes a branch of study, after regular attendance for two full courses.

Allowances will be made to students of Human or Comparative Medicine, or others who can produce certified class tickets for attendance on any of the subjects embraced in the curriculum from any recognized college or university.

Graduates and students who avail themselves of the above privileges will nevertheless be required to pass an examination in the subjects comprised in the three years' course, unless, from satisfactory evidence otherwise produced, the examiners consider it to be unnecessary.

Graduates of recognized Veterinary Colleges desirous of taking the degree may do so by attendance on the final subjects for one full session, but will be required to pass the examinations on all the subjects embraced in the curriculum, botany excepted.

MATRICULATION.

Every student, previous to his admission, must produce a certificate of educational requirements satisfactory to the Faculty, or submit himself to a matriculation examination in (1) writing, (2) reading aloud, (3) dictation, (4) English grammar and (5) composition, (6) outlines of geography, with special reference to North America, (7) arithmetic, including vulgar and decimal fractions.

NOTE.—It is contemplated to add the rudiments of Latin to the matriculation in the near future.

A. N. Shewan, M.A., will hold the matriculation examination on Saturday, 22nd September, 9 a.m., at the College, 6 Union Avenue, when all those intending to enter the course should present themselves for examination. Candidates possessing certificates of education or of previous matriculation should produce them for the inspection and approval of the examiner. Graduates of any Faculty in a recognized University or Agricultural College are not required to matriculate.

No College is recognized unless its students are required to matriculate.

REGISTRATION AND PAYMENT OF FEES.

The following are the College regulations:—

All students desirous of attending the classes shall, at the commencement of each session, enrol their names and residences in the register of the Faculty, and procure from the Registrar a ticket of registration, for which each student shall pay a fee of $5.

The said register shall be closed on the last day of October in each year. The fees are payable to the Registrar, and all class tickets will be issued by him, *and must be paid in advance* at the time of registration; the Registrar will on no consideration issue tickets till the fees are paid. Intending students must govern themselves accordingly.*

All students must register, including those who receive free bursaries.

Fees for the whole course are $75 per session, and, in all cases, must be paid on entering. Matriculation fee, $5, which is to be paid prior to the examination; $5 for registration; and $5 for registration, payable at the beginning of each of the following two Sessions, and $20 on receiving the diploma. Students who are allowed time for previous study will be required to pay full fees, and

* Owing to losses incurred by non-payment of fees, the Registrar must refuse registration till the fees are paid, which may be returned if the applicant fails to matriculate.

$5 for registration each session. Payments must be made in all cases as above.

In addition to the above Faculty fees, every student must pay an annual fee of $3 for athletics.*

STUDENTS OF THE PROVINCE OF QUEBEC.

In consideration of the annual grant, the Council of Agriculture has the privilege of sending thirteen pupils, free of expense, to the whole course; such students, however, pay a fee of $5 for the course in Botany, $5 annually for registration, and $3 annually for athletics. These bursaries may be obtained by young men resident in the Province of Quebec, by application made to the Dean of the Faculty in the handwriting of applicant, accompanied by a recommendation from the Agricultural Society of the district in which they reside, provided the Council considers them qualified by education and in other respects for entering the College.

In all cases, except when specially arranged, Bursars will be required to give a guarantee that they will attend three Sessions, and failing to do so, they shall be required to pay the fees for the Sessions which they have attended. These Bursaries are not intended for nor will they be given to such students as do not require such aid.

SPECIAL REGULATIONS.

Students of this Faculty will be graded as of the first, the second, and the final year. In each year students will take the studies fixed for that year only, unless by special permission of the Faculty.

Persons desirous of entering as Partial Students shall apply to the Dean of the Faculty of admission as such, and shall obtain a ticket or tickets for the class or classes they desire to attend.

Each lecture shall be of one hour's duration, but the Professors shall have the right to substitute an examination for any such lecture.

At the end of each term there shall be a general examination of all the classes, under the superintendence of the Professors, and such other examiners as may be appointed by the Corporation. The results shall be reported as early as possible to the Faculty.

The students have all the privileges of the McGill Medical Faculty's Laboratories, which are thus described in their annual calendar:—

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* *First Year, Fees*	$ 75	*Second Year, Fees*	$ 75	*Third Year, Fees*	$ 75
Matriculation "	5	Registration "	5	Registration "	5
Registration "	5	Athletics "	3	Athletics "	
Athletics "	3			Diploma "	
	$ 88		$ 83		$103

PHYSIOLOGICAL LABORATORY.

The Physiological Laboratory, which is situated on the ground floor, is supplied with the most modern apparatus for the practical teaching of this most important branch of the medical curriculum. It contains, amongst other valuable instruments, kymographs, various manometers, etc., for demonstrating blood pressure; myographs, rheocords, moist chambers, etc., and various electrrcal appliances for demonstrating experiments in connection with nerve and muscle; special apparatus for illustrating various points in respiration; apparatus specially suitable for demonstrating the processes of digestion, as well as the chemical composition and nature of the secretions, and the chief constituents of the tissues and nutritive fluids. The laboratory is arranged in such a way as to permit of Students assisting at, and taking part in these demonstrations. During the past session, important additions of apparatus have been made to the Physiological Laboratory.

CHEMISTRY.

The course in Chemistry embraces Chemical Pnysics, in the first portion of the course, the theory of Chemistry, both inorganic and organic, in the latter part of the course. The Chemical Laboratory, which is available to the Students of Comparative Medicine, is large, lofty and well lighted, and can accommodate comfortably 76 men at one time. Each Student, when entering on his course, has a numbered table in the laboratory assigned to him for his use during the session. Each table has its own gas and water fixtures, and is provided with shelves for its corresponding set of reagent bottles, as well as a drawer and locker containing a modern set of chemical apparatus especially adapted for the work. This apparatus is provided by the Professor of Chemistry, and supplied to each Student without extra charge. The Student is required to pay only for apparatus broken or destroyed.

The laboratory is furnished with a large draught closet for ventilation, sulphuretted hydrogen apparatus, gas and combustion furnaces, etc., giving to the student unsurpassed advantages for acquiring a sound and practical knowledge of medical chemistry.

PATHOLOGICAL LABORATORY.

In the Pathological Laboratory accommodation will be provided for Students or practitioners who desire to carry on advanced study or private pathological research. The laboratory has been entirely re-built recently, and is well stocked with the usual apparatus for pathological and bacteriological work.

The demonstrations in Morbid Anatomy will be given in a small laboratory, specially arranged for the work. The classes in Pathological Histology will be held in the Pathological Laboratory.

Through the generosity of the late Mr. J. H. R. Molson, the large house previously occupied by Professor Harrington has been converted into a Pathological Laboratory, having on the upper floor the Class and Demonstration room, capable of holding practical classes of fifty students. This is fully fitted with microscopes and other apparatus for the purpose of Pathological Histology and Bacteriology. Upon the first floor are the Library and Professor's room, the Preparation and Research rooms, with a smaller Incubator room for Bacteriological use. On the ground floor are situated the animal and store rooms and the apartments of the assistant.

Accommodations will be provided for students or practitioners who desire to carry on advanced study or pathological research.

HISTOLOGICAL LABORATORY.

The Histological Laboratory is a large, well-lighted room on the second floor. It is so arranged that over eighty students can be present at the microscopical demonstrations. For this purpose it is supplied with thirty-five microscopes, all from the well-known makers, Zeiss, Hartnock, and Leitz. From the large number of microscopes employed, students will have special facilities in studying and making themselves thoroughly acquainted with the specimens that are the subject of demonstration.

PRACTICAL MICROSCOPY.

This is an entirely optional course, in charge of Prof. Wilkins, assisted by Dr. Gunn. It is intended especially for teaching the technique of Microscopy. Students will be shown how to examine blood, etc., also to cut, stain, and mount specimens. For this purpose, they will have furnished them normal structures, with which they will be able to secure a cabinet of at least 100 specimens, which will be of great benefit when in practice. Reagents and everything, except cover glasses and cabinet cases, provided. Fee, $8.

COURSES OF LECTURES

ELEMENTARY BIOLOGY.

Prrofessors:—D. P. Penhallow, M.Sc.
E. W. MacBride, M.A., D.Sc.

This Course, under the supervision of the professors of Botany and Zoology, will be given during the autumn term,—Zoology first eight weeks; Botany last four weeks.

1a.—Animal Biology.

The Course in Animal Biology will discuss the fundamental properties of protoplasm; the principles of the formation of tissues; the formation of organs; an outline of vertebrate structure and function, as exemplified by the types Amoeba, Paramecium and Vorticella, Hydra, Lumbricus and the Dog-fish.

Two lectures and one laboratory period each week.

1b.—Plant Biology.

The Course of Plant Biology will deal chiefly with the general properties of cytoplasm; the structure and nature of the plant cell; movement; nutrition; respiration; fixation of carbon; division of labor and origin of organs; evolution of plant forms. These principles will be illustrated in their more simple forms by a Myxomycete, Pleurococcus, Saccharomyces, Spirogyra and Oedogonium, Fucus, and Pteris.

Two lectures and one demonstration each week.

CHEMISTRY.

GILBERT P. GIRDWOOD, M.D.

Inorganic Chemistry is fully treated; a large portion of the course is devoted to Organic Chemistry and its relations to Medicine. The branches of Physics bearing upon or connected with Chemistry also engage the attention of the Class. For experimental illustration, abundant apparatus is possessed by the College.

The Chemical Laboratory will be open to members of the Class to repeat experiments performed during the course, under the superintendence of the Professor or his Assistant.

PHYSIOLOGY.

T. WESLEY MILLS, M.A., M.D., D.V.S.

The purpose of this course is to make students thoroughly acquainted, so far as time permits, with modern Physiology, its methods, its deductions, and the basis on which the latter rest. Accordingly, a full course of lectures is given, in which both the Physical and the Chemical departments of the subject receive attention.

In addition to the use of diagrams, plates, models, etc., every department of the subjects is experimentally illustrated. The experiments are free from elaborate *technique*, and many of them are of a kind susceptible of ready imitation by the student.

Laboratory work for Senior Students:—

(1) During a part of the Session there will be a course on Phy-

siological Chemistry, in which the student will, under direction, investigate food-stuffs, digestive action, blood, and the more important secretions and excretions, including urine. All the apparatus and material for this course will be provided.

(2) The remainder of the session will be devoted to the performance of such experiments as are unsuitable for demonstration to a large class in the lecture room and such as require the use of elaborate methods, apparatus, etc. The course for first year students is similar to that for senior students, though less advanced, and more attention will be given to the anatomico-physiological aspects of the subject than to the chemical.

HISTOLOGY.

GEO. WILKINS, M.D.

This will consist of a course of ten lectures and twenty-five weekly demonstrations with the microscope. As the demonstrations will be chiefly relied upon for teaching the Microscopic Anatomy of the various structures, the specimens under observation will then be minutely described. Plates and diagrams specially prepared for these lectures will be freely made use of.

COMPARATIVE PATHOLOGY.

J. G. ADAMI, M.D., Professor.
C. F. MARTIN, M.D., Lecturer.

The teaching in Pathology at McGill Medical College includes courses in general and special Pathology, in Bacteriology (held during the summer Session), and instruction in the performance of Autopsies. These courses—while directed especially towards giving to the Students a due knowledge of the causation and course of disease in man—are necessarily based largely upon the results of observations upon the lower animals, and the greater part of all these causes is applicable equally to conditions obtaining in the domestic animals. There is in addition a practical course of Pathological Histology for Students of Comparative Medicine, and instruction is given upon the performance of Autopsies upon the lower animals.*

MEDICINE AND SURGERY.

D. MCEACHRAN, F.R.C.V.S.

Students of all years must attend.

The course embraces the principles and practice of Veterinary Medicine, including the diseases of domestic animals, their nature,

* Undergraduates in the second and third sessions are particularly recommended to take the practical course in Bacteriology during the summer session, if possible.

causes, symptoms, and treatment. It necessarily includes Pathology and Pathological Anatomy, with daily clinical demonstrations in the hospital and the yard practice of the College, as well as illustrations from plates, preserved specimens, and fresh material furnished by the Pathologist.

The course on Surgery embraces Surgical Anatomy and Practices of Surgery, and will be illustrated by a large collection of surgical appliances.

The large and varied practice of the College furnishes abundance of cases for demonstration purposes. Attendance and practical work in the Pharmacy and Hospital is compulsory during the entire course, in the order arranged at the beginning of each Session, and forms an important part of the qualifications for graduation.

ANATOMY.

M. C BAKER, D.V.S.

In this course the Anatomy of the horse is the subject of special study, while the structural differences of all the domestic animals are carefully explained and illustrated by fresh subjects. There is a very large collection of anatomical models by Dr. Auzoux, of Paris, natural injections and dissections, and a most complete collection of diagrams, including Marshall's complete set, Mons. Achille Compte's Anatomical and Zoological series; also a large collection of drawings specially prepared for the school by Mr. Scott Leighton, artist, Boston, and Mr. Hawksett, Montreal.

The dissecting room is open at all hours, subjects are easily procured, and either the Professor or Demonstrator will be in attendance to superintend and direct students in practical dissection. The room is furnished with every convenience, is thoroughly lighted, and affords students all that can be reasonably desired.

Students are required to pay for the material necessary for practical anatomy.

Before a student can be allowed to present himself for his pass examination, he must procure tickets certified by the demonstrator that he has dissected two entire subjects,—that is, one each session.

MATERIA MEDICA AND THERAPEUTICS.

NEIL GUNN, M.D., Lecturer.

This course comprises a description of the physiological and therapeutic action of all the more important medicines used in Veterinary Practice, with a short reference to their general properties and principal preparations. It will also include a course in the practical work of compounding and administering medicines in the pharmacy and hospital. There will also be experimental demonstrations of the action of some of the more important drugs on animals.

CATTLE PATHOLOGY AND OBSTETRICS.

C. McEachran, D.V.S.

A special course on Cattle Diseases and Veterinary Obstetrics will be delivered, embracing the history of Cattle Plagues; their nature, symptoms, pathological anatomy, prophylactic and therapeutic treatment; breeding and general management of breeding animals, disease incident to gestation and parturition, etc.

SPECIAL COURSE ON DOGS.

Professor Wesley Mills will give a special Course on Dogs, which will include—

(1.) Lectures on the physical and psychic characteristics of all the leading varieties, illustrated by specimens from his own kennels and other sources, as well as by plates, etc.

(2.) The principles of training; the feeding and general management of dogs.

(3.) The principles of breeding; the management of brood bitches and the rearing of puppies.

(4.) Bench show management and the public judging of dogs.

(5.) The rights and duties of dog owners.

In all the above courses the clinical and pathological aspects of the subject will be considered, as well as the normal.

THE MUSEUM

Contains a large collection of natural and artificial specimens, consisting of skeletons of almost all the domestic animals, numerous specimens of diseased bones, preparations by Dr. Auzoux of all the different organs in the body, natural dissections, colored models, diagrams, etc., etc., all of which are used in illustrating the lectures, and to which the Students have frequent opportunities of referring. Students will also enjoy the privileges of the Museum of the Medical Faculty of McGill University, which is rich in pathological specimens.

THE PHARMACY.

All the medicines used in the practice of the College are compounded by the Students, under the direction of the Professors, from prescriptions for each particular case, and most of them are administered or applied by them. For this purpose they are detailed for certain pharmaceutical duties alternately. By this means they become familiar with the physical properties, compatibilities, doses and uses of the medicines, and become expert in administering them to the different patients brought for treatment. Attendance and practical work in the Pharmacy are compulsory.

THE PRACTICE.

The Hospital and Daily Clinics, as well as a very extensive outdoor practice, including most of the largest stables in the city and numerous farms in the vicinity, afford excellent opportunities for clinical observation on horses of all breeds and ages. Owing to the numbers of cattle kept in the city, and the valuable thoroughbred herds in the neighbourhood, advanced Students are enabled to see and do considerable cattle practice. The dog practice is the largest in Canada. All canine diseases can be studied clinically, owing to the large number of dogs brought to the College for medical or surgical treatment.

Senior Students will be appointed to act alternately as dressers in the Hospital, and first and second year men must assist in administering medicines and at operations.

*TEXT BOOKS.

The following text-books are recommended:—

Anatomy.—Chauveau's Comparative Anatomy; Strangeway's Veterinary Anatomy; McFadyean's Veterinary Anatomy; Dissector's Manual, Clement.

Physiology.—Physiology for Beginners by Foster & Shore; Prof. Mills' Text Book of Comparative Physiology; Class Laboratory Exercises, by the same author.

Histology.—Klein's Elements; Schafer's Essentials of Histology.

Botany.—Gray's Structural Botany; Bessey's Botany.

Zoology.—Dawson's.

Chemistry.—Wurtz's Elementary Chemistry; Armstrong; Remsen's Organic Chemistry.

Medicine and Surgery.—Williams' Principles and Practice of Veterinary Medicine; Fleming's Sanitary Science and Police; Williams' Surgery; Fleming's Operative Surgery; Robertson's Equine Medicine; Liautard's Operative Veterinary Surgery; Zuill's Translation of Friedberger and Frôhner's Pathology, etc.

Materia Medica.—Dun's Veterinary Medicines; Walley's Veterinary Conspectus; Tuson's Pharmacy; Hoare's Therapeutics.

Cattle Diseases.—Steel's Bovine Pathology; Clatter's Cattle Doctor (Armitage); Fleming's Veterinary Obstetrics.

Canine Diseases.—Prof. Mills' The Dog in Health and in Disease.

Diseases of the Dog.—Geo. Müller, tr. by A. Glass, V.S.

Entozoa.—Cobbold's Entozoa of Domestic Animals.

Pathology.—Payne's Pathology; Fraenkel's Bacteriology; Clement on Post Mortems.

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* Students are advised not to buy text books extensively till after consultation with the Professor who teaches the subject.

VETERINARY MEDICAL ASSOCIATION.

This Association is for the mutual improvement of its members in all matters pertaining to the profession.

Graduates and students of Veterinary Medicine and graduates and students of Human Medicine are eligible to membership.

The meetings are held fortnightly, at which papers are read and discussed, cases reported, etc.

The advantages which students derive from these meetings are very great. Not only do they hear carefully prepared papers on subjects of professional importance, but an opportunity is afforded for practising public speaking, which in after life is often extremely useful. The fees of the Association are expended in the purchase of books for the Library, drugs for experimental purposes, and the prizes awarded for papers read.

The Library is owned by the Association, and is under the control of officers who are elected annually. It contains nearly 600 volumes, embracing works of great antiquity, as well as the modern works on Veterinary Science and collateral subjects, in both the English and French languages, all of which are available for consultation and study by members.

Every student is expected to become a member. The entrance fee is $5, and the yearly subscription $2.50. A Diploma of Honorary Fellowship is conferred on all members who have complied with the regulations of the Association.

ASSOCIATION FOR THE STUDY OF COMPARATIVE PSYCHOLOGY.

This Society is similar in construction to the Veterinary Medical Association, and has a special library of about 100 volumes. Its object is the study of the Psychic Phenomena (intelligence, etc.) of all classes of animals, and the diffusion of sounder views on this subject. Naturally, it is of great importance in the practice of medicine upon dumb animals as well as of peculiar scientific interest.

DONATIONS.

The late John Wesley Gadsden, M.R.C.V.S., of Philadelphia, Penn., U.S.A., generously donated to this Faculty his valuable library of nearly 400 volumes and the specimens of his private museum, many of which are of unusual value.

QUALIFICATIONS FOR THE DEGREE.

Candidates for the Final Examination shall furnish testimonials of attendance on lectures on the following subjects.

Either Botany or Zoology—One course of six months, 1st year.

Histology, Chemistry, Physiology, Anatomy — Two courses of six months, 1st and 2nd years.

General Pathology and Demonstrations, one course of six months.

Cattle Diseases and Obstetrics
Practice of Medicine and Surgery. Two courses, 2nd and 3rd year.
Materia Medica and Therapeutics.

No one will be permitted to become a candidate for examination who shall not have attended at least one full course of lectures in this Faculty, including all the subjects embraced in the curriculum. Courses of less length than the above will be received only for the time over which they have extended.

Students, except by special permission of the Faculty, must pursue the subjects of Anatomy, Physiology, Chemistry, Histology, and Botany or Zoology in their first session.

Candidates of the 1st and 2nd years, who fail to pass in not more than two subjects, may be granted a supplementary examination at the beginning of the following session. Supplementary examinations will not be granted, except by special permission of the Faculty and on written application stating reasons, and on payment of a fee of $2, which must be paid prior to examination.

Candidates who fail to pass in a subject of which two courses are required, may, at the discretion of the Faculty, be required to attend a third course, and furnish a certificate of attendance thereon.

In addition to the written and oral examinations, candidates must pass a practical clinical test, including examination of horses for soundness, written reports being required; the clinical reports to include diagnosis, prognosis, and treatment.

The following oath or affirmation will be exacted from the candidate before receiving the degree:—

DECLARATION OF GRADUATES IN COMPARATIVE MEDICINE AND VETERINARY SCIENCE.

I, —— ——, promise and solemnly declare that I will, with my best endeavors, be careful to maintain the interests of this University, and that, to the best of my ability, I will promote its honor and dignity.

EXAMINATIONS.

First Year.—Pass Examinations in Botany or Zoology, Histology (oral), 1st Chemistry, Anatomy, Physiology, and on all other subjects in the course of this year.

Second Year.—Pass Examinations in Chemistry, Physiology, Histology (written), and Anatomy, in addition to sessional examinations in these and the other subjects of the year.

Third Year.—Pass Examinations in Practice of Medicine and Surgery, General and Special Pathology, Veterinary Obstetrics, Diseases of Cattle, and Materia Medica and Therapeutics.

N.B.—Written and Oral Examinations will be held from time to time during the session, and attendance at these is compulsory. The standing attained at these examinations will be taken into account at pass examinations.

AGE FOR GRADUATION.

Students under seventeen will be received as apprentices, but cannot be entered as regular Students before attaining that age.

Minors may pass the Examinations, but cannot receive the Diploma until they are twenty-one years of age.

REGULATIONS GOVERNING THE CONFERRING OF THE DEGREE UPON FORMER GRADUATES OF THE MONTREAL VETERINARY COLLEGE.

The Degree of Doctor of Veterinary Science may be conferred on former graduates of Montreal Veterinary College at any Convocation of McGill University held for conferring degrees, subject to the following regulations, which were adopted at a meeting of the Corporation of McGill University, held on the 22nd January, 1890, governing the conferring of Degrees on former graduates:—

1st.—That the candidate must be found to have conducted himself throughout his professional career with honor and integrity.

2nd.—That he has not been connected with the manufacture or sale of proprietary medicines.

3rd.—That he has been engaged in actual practice for at least one year since graduating, or that he has been engaged in professional study at some European school.

4th.—That he shall be required to satisfy the Board that he has made reasonable progress in professional knowledge and skill.

In estimating the fitness of a candidate for a degree, account will be taken specially of work done in professional teaching, original re-

search, publication of books or contributions to the journals of the profession.

The fee for the Diploma shall be Twenty Dollars.

An affirmation shall be administered similar to that of other Faculties, and in English.

The Degree may be conferred on absentees.

The regulations relating to fees and affirmations shall apply to ordinary undergraduates on taking the degree.

Graduates intending to apply for the Degree of D.V.S. should notify the Registrar of the Faculty at their earliest convenience, and at the same time state the grounds explicitly on which they base their claims for the Degree.

McGill Normal School.

The McGill Normal School, in the city of Montreal, is established chiefly for the purpose of training teachers for the Protestant population, and for all religious denominations of the Province of Quebec other than the Roman Catholic. The studies in this school are carried on chiefly in English, but French is also taught.

Government of the School.

The Corporation of McGill University is associated with the Superintendent of Public Instruction in the direction of the McGill Normal School, under the regulations of the Protestant Committee of the Council of Public Instruction, and it is authorized to appoint a standing committee consisting of five members, called the "Normal School Committee," which shall have the general supervision of the affairs of the Normal School. The following members of the Corporation of the University constitute the committee of the Normal School for the Session of 1900-1901.

NORMAL SCHOOL COMMITTEE.

Prof. W. Peterson, M.A., LL.D., Principal of the University, *Chairman.*

Mr. Samuel Finley, Governor of McGill College.

Rev. Principal MacVicar, D.D., LL.D., } Fellows of
J. R. Dougall, M.A., } McGill University.
Rev. E. I. Rexford, B.A., }

J. W. Brakenridge, B.C.L., *Secretary.*

OFFICERS OF INSTRUCTION.

McGill Normal School.

Sampson Paul Robins, M.A., LL.D., *Principal and Ordinary Professor of Mathematics and Lecturer on Art of Teaching.*

Abner W. Kneeland M.A., B.C.L., *Ordinary Professor of English Language and Literature.*

MADAME SOPHIE CORNU, *Professor of French.*
MISS GREEN, *Professor of Drawing.*
——— ———, *Instructor in Music.*
MISS LILLIAN B. ROBINS, B.A., *Assistant to the Principal and Instructor in Classics.*
MR. W. H. SMITH, *Instructor in Tonic Sol-Fa.*
MR. JNO. P. STEPHEN, *Instructor in Elocution.*
PROF. D. P. PENHALLOW, M.A.Sc., *Lecturer on Botany.*
——— ———, *Lecturer on Physiology and Hygiene.*
NEVIL N. EVANS, M.A.Sc., *Lecturer on Chemistry.*
MR. JAMES WALKER, *Instructor in Penmanship and Book-keeping.*
MISS LOUISE DERICK, *Instructor in Kindergarten Methods.*
MR. A. W. ARTHY, *Lecturer in the Theory of Kindergarten and Transition Work.*

MODEL SCHOOLS OF THE McGILL NORMAL SCHOOL.

——— ———, *Head Master of Boys' School.*
MISS MARY I. PEEBLES, *Head Mistress of Girls' School.*
MISS SELINA F. SLOAN, *Head Mistress of Primary School.*

ANNOUNCEMENT FOR THE SESSION 1900-1901.

This Institution is intended to give a thorough training to teachers, by instruction and training in the Normal School itself, and by practice in the Model Schools; and the arrangements are of such a character as to afford the greatest possible facilities to students from all parts of the province. Hereafter the Protestant Central Board of Examiners for the Province of Quebec will grant diplomas only to teachers-in-training of this Institution and to graduates of British or Canadian Universities.

The forty-fifth Session of this School will commence on the third of September, 1900, and close on the thirty-first of May, 1901. The students are graded as follows:

1.—*Elementary Class.*—Studying for the Elementary Diploma.

2.—*Advanced Elementary Class.*—Studying for the Advanced Elementary Diploma.

3.—*Model School Class.*—Studying for the Model School Diploma.

4.—*Kindergarten Class.*—Studying for the Kindergarten Diploma.

5.—*Class in Pedagogy.*—Preparing for the Academy Diploma.

Detailed information respecting the courses of the four grades first enumerated above may be obtained on application to the Principal of the School, 32 Belmont Street, Montreal.

ACADEMY DIPLOMAS TO GRADUATES.

All holders of model school diplomas that have been granted by the McGill Normal School or that shall hereafter be granted by the Central Board of Examiners, shall be entitled to receive academy diplomas on graduating in Arts at some Canadian or other British University, provided that they pass in Mathematics, Latin, Greek and French at the degree examinations, or failing this, in any subject or subjects, pass examinations in such subject or subjects certified by the universities to have given to the graduate concerned a standing not lower than that of second class at the close of the second year in Arts.

All graduates in Arts of Canadian or other British Universities who have passed in Mathematics, Latin, Greek and French as above defined, and have taken a course and have passed satisfactory examinations in education and in practical teaching under the control of the Universities or of the McGill Normal School as approved by the Protestant Committee of the Council of Public Instruction, shall be entitled to receive academy diplomas. The Central Board of Examiners shall determine who have passed satisfactory examinations in education and in practical teaching in view of the results, which, including examination questions and answers, shall be remitted to the Board by the university examiners, and in view of the recommendations of the professors of education. The Central Board of Examiners is empowered to set one-half of the questions on education, and to prescribe tests of ability to teach and to govern, which must be followed in such examinations.

To meet the requirements of graduates and undergraduates in Arts, who, not having previously taken a Normal School course, desire to receive Academy diplomas, and until the Universities themselves undertake the work, provision has been made for the delivery of a course of lectures on pedagogy in the Normal School and for practice in teaching in the McGill Model School for fifty half days, open to graduates in Arts of any British or Canadian University, to undergraduates of the third year, and with the permission of the Faculty and the concurrence of the Principal of the Normal School, to those of the fourth year. The hours assigned for these lectures are from 3 p.m. to 4 p.m. on each Tuesday and Friday on which lectures are given in the Faculty of Arts. An examination on this course of lectures is held annually on the 20th day of May, or on the school day next succeeding that date; the hours are from 10 a.m. to 12 noon.

Undergradutes will be permitted to teach the fifty half days referred to above, at times extending over the sessions of the Model School, corresponding to the third and fourth years of their college course. Graduates will be permitted to teach in the Model Schools at such times as may be agreed on with the Principal. Those who teach in the Model Schools are expected to prepare all lessons and discharge all duties assigned them with faithfulness. Failure to teach or to govern in the Model Schools, no less than failure to pass the examination on the course of lectures, endangers the Academy Diploma.

Each person taking this course of study in the Normal School shall be held to be subject to the regulations of the said school and to be under the supervision of its Principal while in attendance thereat, and is required to furnish him with all necessary certificates of standing and of good character, as well as to pay to the Secretary of the Central Board of Examiners the fee of $4.00 before entering on the Course.

Passed the University Examinations.

SESSION 1899-1900

FACULTY OF LAW.

PASSED FOR THE DEGREE OF B.C.L.

(In order of merit.)

Chauvin, Henry N.,	Montreal.	Margolese, L.,	Montreal.
Archibald, Sam. G., B.A.	Montreal.	Rinfret, T.,	Montreal.
Macfarlane, L., B. A.	Montreal.	Walsh, Thos. E., B. A.	(Laval) Montreal.
Garneau, L.,	Ottawa.		
Macalister, A. W. G.,	Danville, Q.	Redpath, Jocslyn C.,	Montreal.
Baker, Geo. H.	Sweetsburg, Q.	Mackay, Hugh,	Montreal.

FACULTY OF ARTS.

PASSED FOR THE DEGREE OF B.A.

In Honours.

(Alphabetically arranged.)

First Rank.—Cook, H. Lester.
Crowell, Bowman C.
Dey, M. Helena.
Garlick, Edythe A.
Johnson, J. Guy Watts.
McGregor, Claire R.
Marcuse, Bella.
Newson, Wm. V.
Nutter, J. Appleton.
Radford, E. Alan.
Weinfield, Henry.
Willis, Jas. J.
Woodley, Edward C

Second Rank.—Cochrane, Donald.
Cohen, Abraham.
Forbes, Wilfrid.
Hardy, Chas. A.
Jackson, E. Gertrude } equal
Macmillan, Cyrus J. }
Rorke, Helen.

Ordinary B.A.

(In order of merit)

Class I.—Ferguson, Colin C.
Elder Robert.
Rowell, Arthur H.

Class II.—Lee, Henry S.
Smith, Lillian A.
Ells, Sydney C. } Mackinnon, Cecil G. }
Grier, Geo. W. } Lundie, Jessie F. }
Holman, Carrie E.
Ainley, Lawrence.
Crack, Isaac E.
DeWitt, Jacob.

Class III.—Perley, Francis B.
Laverie, Jas. H. } Stewart, Donald. }
Fyles, Faith.
Duguid, R. Colin.

STUDENT REGISTERED IN THE FACULTY OF APPLIED SCIENCE PROCEEDING TO THE DEGREE OF B.A. IN COURSE.

McKenzie, Bertram S.

STUDENTS REGISTERED IN THE FACULTY OF MEDICINE PROCEEDING TO THE DEGREE OF B.A. IN COURSE.

Dixon, James D.

Larmonth, Geo. E.

B.A. IN ABSENTIA.

Meiklejohn, Harriet T.

STUDENTS IN ARTS REGISTERED IN THE MEDICAL FACULTY WHO WILL BE QUALIFIED TO OBTAIN THE DEGREE OF B.A. IN JUNE, 1900, ON COMPLETING THEIR MEDICAL YEAR.

(*In alphabetical order*).

Ritchie, C. F.
Walker, H.

B.A. (*Special*).

Oakeley, Hilda D.

ADMITTED TO THE DEGREE OF B.SC. (AD EUNDEM GRADUM).

Rutherford, E., B.Sc. (N.Z.)

BACHELORS OF ARTS PROCEEDING TO THE DEGREE OF M.A. IN COURSE.

OAKELEY, HILDA D.
HAMMOND, ELIZABETH, B.A.
VAUDRY, OLIVE, B.A.
CARR, MURIEL, B.A.
KEITH, HENRY J., B.A.

BACHELOR OF ARTS PROCEEDING TO THE DEGREE OF M.SC. IN COURSE.

DOVER, MARY VIOLETTE, B.A.

AMDITTED TO THE DEGREE OF M.A. (AD EUNDEM GRADUM).

COLE, W. G., M.A. (Harv.).

MASTER OF ARTS PROCEEDING TO THE DEGREE OF D.SC.

BARLOW, ALFRED, M.A.

ADMITTED TO THE DEGREE OF LL.D. HONORIS CAUSA.

BARKER, GEO. F., Prof. of Physics in the University of Penn.
MAHAN, ALFRED T., Captain U.S.N.
WHITEAVES, J. F., F.R.S.C., Geological Survey, Ottawa.

INTERMEDIATE EXAMINATION.

Class I.—CROWELL, S. G.
HARRIS, S. L. D.
IRVING, ELIZABETH.
NOLAN, ANNIE W. } PLANT V. L. } PRUYN, W. G. }
MUNN, W. C.

Class II.—CARLYLE, E. J. } MURPHY, H. H. }
DIXON, JENNIE D.
WARRINER, J. EVA.
HITCHCOCK, CAROLINE L. } JACK, M. } MCDONALD, J. A. }
MCLACHLAN, JESSIE W.
CLOGG, VIVIAN E. } ELLISON, ADA A }
WALKER, J. J.
COLE, G E. } MILLER, W. E. } SMITH, MIRIAM G. }
BICKERDIKE, MAY C.

Class III.—CARSON, H. A. } GREENLEESE, MARY S. } MUIR, K. C. }
MUNN, E. M.† } ASCAH, R. G. }
FOX, F. H } CROTHERS, H. R. }

ADAMS, C. A.
BLAGRAVE, R. C. (*s*).
DAY, DAISY. W. (*s*).
IRELAND, F. C. (*s*).
OGILVIE, G. L. (*s*).
PARKER, D. T. (*s*).

s. With Supplemental in one subject (arranged alphabetically.)
† *Morrin College.*

FACULTY OF APPLIED SCIENCE.

PASSED FOR THE DEGREE OF BACHELOR OF SCIENCE.

(In Order of Merit.)

CIVIL ENGINEERING.

Ewart, George Robert, Kilauea, Kanai, Hawaiian Islands.
Byers, Archibald Fullarton, Gananoque, Ont.
Burgoyne, Stanley John, Halifax, N. S.

ELECTRICAL ENGINEERING.

Allen, Samuel James, Maitland, N. S. } equal
Nelson, George John, Montreal. }
Duncan, Gaylen Rupert, Montreal.
Glassco, Jack Girdlestone, Hamilton, Ont.
Miller, Angus Kenneth, Bridgeburg, Ont.
St. George, Harry Luxmoore, Montreal.
Cornwall, Clement Arthur Kingscote, Ashcroft, B. C.
Montgomery, George, Morrisburg, Ont.
Fraser, John William, Bridgeville, N. S.

Shepherd, Harry Lawrence, Brockville, Ont. (aegrotat)

MECHANICAL ENGINEERING.

Hamilton, George Milne, Peterboro, Ont.
Walker, Frank Wilkes, Montreal.
Arkley, Lorne McKenzie, East Angus, Que.
Macmaster, Arthur William, Montreal.

Neville, Thomas Patrick Joseph, Halifax, N. S.
Smith, George Barnett, Stratford, Ont.
Osborne, James Ewart Kerr, Toronto, Ont.

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also (special)

Percy, Howard Meredith, Montreal.

MINING ENGINEERING.

Gillean, Robert Hampson, Montreal.
Robertson, Philip Wm. Katthain, Mexico City, Mex.
Corriveau, Raoul de Besserer, Iberville, Que.
Moore, Ernest Vivian, Peterboro, Ont.
Maclennan, Frank William, B.A.Sc., Cornwall, Ont.
Cowans, Frederick, Montreal.
Buchanan, Fitzherbert Price, Montreal.
Nicholls, Harry Graburn, Toronto, Ont.
Stevens, Angus Pattee, Dunham, Que.
(also, in alphabetical order)
Allan, Leigh, Tacoma, Wash., U.S.A.
Andrewes, Edward, Grimsby, Ont.
Leman, Beaudry, Montreal.

PRACTICAL CHEMISTRY.

Barber, Rene Raoul, Georgetown, Ont.

ADMITTED TO THE DEGREE OF BACHELOR OF SCIENCE.

(Ad eundem.)

Owens, Robert Bowie, E.E. (Columbia, Johns Hopkins.)
Rutherford, Ernest, M.A., B.Sc. (N.Z.).

ADMITTED TO THE DEGREE OF MASTER OF SCIENCE.

(In Course.)

Coker, Ernest George, B.Sc. (Cambridge, Edinburgh and McGill.)
Hutchinson, William Scott, B.Sc. (McGill.)
Kirkpatrick, Stafford Frederick, B.Sc. (McGill.)
Owens, Robert Bowie, B. Sc. (Columbia, Johns Hopkins, McGill.)
Rutherford, Ernest, B.Sc. (N.Z. and McGill).
Stovel, Russell Wellesley, B.A.Sc. (McGill.)
Whiteside, Orton Edward Simpson, B.A.Sc. (McGill.)
Yuile, Norman McLeod, B. Sc. (McGill.)

ADMITTED TO THE DEGREE OF DOCTOR OF SCIENCE.

(In Course.)

Barnes, Howard Turner, M.Sc. (McGill.)

FACULTY OF COMPARATIVE MEDICINE AND VETERINARY SCIENCE.

PASSED FOR THE DEGREE OF D.V.S.

Humphries, B. F.	Boston, Mass,
Stanbridge, G. W.	Hubbardston, Mass.
Allen, F. T.	Springfield, Mass.
Smith, W. C.	Winnipeg, Man.

Scholarships and Exhibitions.

SESSION 1899-1900.

FACULTY OF ARTS.

I. Scholarships (Tenable for two years).

Year of Award.	Names of Scholars.	Subjects of Examination.	Annual Value.	Founder or Donor.
1898	Radford, E. Alan	Mathematics	$125	Sir W. C. Macdonald
1898	Dey, Mary Helen	Mathematics	125	Lord Strathcona and Mount Royal
1898	Cochrane, Donald	Nat. Science	125	Sir W. C. Macdonald
1898	Ferguson, Colin C.	Class. & Mod. Lang	100	Miss Barbara Scott
1898	Nutter, J. Appleton	Class. & Mod. Lang	90	Chas. Alexander, Esq.
1899	Barrington, Fred H.	Mathematical	125	Sir W. C. Macdonald
1899	MacNaughton, W.G.	Nat. Science	125	Sir W. C. Macdonald
1899	Copeman, Jos. Hodge	Class. & Mod. Lang	100	Anonymous
1899	Cotton, Wm U.	Class. & Mod. Lang	90	Anonymous

II. Exhibitions (Tenable for one year).

Names of Exhibitioners.	Academic Year.	Annual Value.	Founder or Donor.
Munn, W. Clement	Second	$125	George Hague, Esq.
Crowell, Sam G.	"	125	Sir W. C. Macdonald
Wisdom, Katherine F.	First	120	Anonymous
Healy, Walter J.	"	125	Sir W. C. Macdonald
McGougan, Edward	"	125	Sir W. C. Macdonald
McMorran, T. S.	"	125	Sir W. C. Macdonald
Angus, Jean M.	"	100	Lord Strathcona and Mount Royal
Lundie, Helen	"	100	Lord Strathcona and Mount Royal
Dease, Jean P.	"	100	Lord Strathcona and Mount Royal
Leaman, John C.	"	125	Sir W. C. Macdonald
Lomer, Gerhard R.	"	125	Sir W. C. Macdonald

At the First Year Exhibition Examination, Bursaries, given by Dr. Johnson, value $50 each, were awarded to Gui C. Couture and Ada D. Dickson.

Prizes, Honours and Standing.

SESSION 1899-1900.

FACULTY OF LAW.

RESULTS OF EXAMINATIONS.

THIRD YEAR.

H. N. Chauvin, First Rank Honours, Elizabeth Torrance Gold Medal and Prize of $40.

S. G. Archibald, First Rank Honours and Prize of $40.

L. Macfarlane, First Rank Honours and Prize of $25.

STANDING IN THE CLASSES.

ROMAN LAW—Dean WALTON, Examiner.

Chauvin, Archibald, Macalister, Garneau, Macfarlane and Walsh, Baker, Redpath, Margolese and Rinfret, equal ; Mackay.

CONSTITUTIONAL LAW—Dean WALTON, Examiner.

Archibald, Garneau, Chauvin, Rinfret, Baker, Macfarlane, Macalister, Margolese, Mackay, Walsh, Redpath.

AGENCY AND PARTNERSHIP—Prof. MCGOUN, Examiner.

Chauvin, Macfarlane, Baker, Rinfret, Garneau, Macalister and Margolese, equal ; Archibald, Mackay, Walsh and Redpath, equal.

SUCCESSIONS, GIFTS AND SUBSTITUTIONS—Hon. Mr. Justice DOHERTY, Examiner.

Chauvin, Garneau, Macalister, Macfarlane, Margolese, Archibald and Rinfret, equal ; Baker, Mackay, Redpath, Walsh.

MARRIAGE COVENANTS, MINOR CONTRACTS, MUNICIPAL LAW—Prof. FORTIN, Fxaminer.

Chauvin, Archibald, Rinfret, Macfarlane, Walsh, Garneau, Margolese, Baker, Macalister, Mackay, Redpath.

REAL RIGHTS—Prof. MARLER, Examiner.

Chauvin, Archibald, Macfarlane, Garneau, Rinfret, Margolese, Mackay and and Baker, equal ; Macalister, Walsh, Redpath.

INTERNATIONAL LAW—Prof. LAFLEUR, Examiner.

Macfarlane, Chauvin, Archibald, Macalister, Garneau, Margolese, Redpath, Rinfret, Baker, Walsh, Mackay.

CRIMINAL LAW—Hon. Mr. Justice DAVIDSON, Examiner.

Chauvin, Redpath, Macalister, Macfarlane, Walsh, Archibald, Garneau, Baker, Margolese, Rinfret, Mackay.

COMMERCIAL LAW—Prof. SMITH, Examiner.

Chauvin, Archibald, Macfarlane, Macalister, Margolese, Garneau, Baker, Mackay, Rinfret, Redpath, Walsh.

OBLIGATIONS—Mr. GEOFFRION, Examiner.

Archibald, Chauvin, Macalister, Walsh, Macfarlane, Garneau and Baker, equal; Margolese, Redpath, Rinfret, Mackay.

CIVIL PROCEDURE—Mr. RYAN, Examiner.

Chauvin, Margolese, Macfarlane, Garneau, Archibald and Baker, equal; Macalister, Rinfret, Mackay, Redpath, Walsh.

SECOND YEAR.

Place, E. G., B.A., First Rank General Standing and Prize of Fifty Dollars.
Campbell, G. A., B.A., First Rank General Standing and Prize of $25.
McMichael, R. C., First Rank General Standing.
Doak, A. E., First Rank General Standing.
Thompson, J. R., First Rank General Standing.
Rowat, D. M., B.A., First Rank General Standing.

IN ADDITION THE FOLLOWING PASSED THE SESSIONAL EXAMINATIONS, IN ORDER OF MERIT.

Mann, Skinner, McMaster, Moffatt, Mitchell, Holden, Westover, Springle, Curran, Normandin.

STANDING IN THE CLASSES.

AGENCY AND PARTNERSHIP—Prof. McGOUN.

Doak, McMaster, Thompson, Place, McMichael, Campbell, Rowat, Mann, Moffatt, Skinner, Curran, Holden, Mitchell, Springle, Westover, Normandin.

MARRIAGE COVENANTS AND MINOR CONTRACTS—Prof. FORTIN.

Place, Campbell, McMichael, Thompson, Mann, Doak, Rowat, Normandin, Mitchell, Holden, Skinner, Moffatt, Springle, McMaster, Westover, Curran.

GIFTS AND SUBSTITUTIONS—Hon. Mr. Justice DOHERTY.

Place, Campbell, Thompson, McMichael and Doak, equal; Rowat, Mann Holden, McMaster, Moffatt, Skinner, Mitchell, Westover, Curran, Springle, Normandin.

REAL PROPERTY LAW—Prof. MARLER.

Place and Rowat, equal; Doak, Thompson, McMichael, Campbell, Mann, Skinner, Holden, Normandin, Moffatt, McMaster, Westover, Springle. The last six all equal. Mitchell, Curran.

PRIVATE INTERNATIONAL LAW—Prof. LAFLEUR.

Place, Campbell, Rowat, McMichael, Doak, Thompson, Holden, McMaster, Westover; Mann and Mitchell, equal; Moffatt, Skinner, Curran, Springle, Normandin.

CRIMINAL LAW--Hon. Mr. Justice DAVIDSON.

Campbell, Place, Thompson, McMichael, Doak, McMaster, Mann, Skinner and Rowat, equal; Mitchell and Westover, equal; Moffat, Holden, Normandin, Springle, Curran.

COMMERCIAL LAW—Professor R. C. SMITH.

Doak, Thompson, Place, McMichael, Campbell, Rowat, Skinner, Normandin, and Moffat and Mitchell, equal; Mann, Holden, McMaster, Westover, Springle, equal; Curran.

CONSTITUTIONAL LAW –Dean WALTON.

McMichael, Campbell, Rowat, Place, Mitchell, Thompson, Doak and Mann, equal; McMaster and Skinner, equal; Holden and Springle, equal; Westover, Moffatt, Curran, Normandin.

CIVIL PROCEDURE—Mr. RYAN, Examiner.

Place, Campbell, Doak, McMichael, Mann, Rowat and Thompson, equal; Moffat, Skinner, Holden, Westover, Mitchell, McMaster, Normandin, Curran, Springle.

FIRST YEAR.

A. Wainwright, B.A., First Rank General Standing and Scholarship of One Hundred Dollars.

C. M. Cotton, B.A., and C. G. Ogden, equal; First Rank General Standing and Scholarship of Fifty Dollars each.

F. F. Astle, First Rank General Standing.

W. Gariépy, B.A., First Rank General Standing.

A. H. Duff, B.A., First Rank General Standing.

IN ADDITION TO THE ABOVE THE FOLLOWING PASSED THE SESSIONAL EXAMINATIONS IN ORDER OF MERIT.

Aylmer, Brown, Vipond, Bonin, Cooper, Staveley, Belknap.

STANDING IN THE CLASSES.

ROMAN LAW—Dean WALTON.

Wainwright; Cotton and Ogden, equal; Astle, Gariépy, Duff, Brown, Bonin, Aylmer, Vipond, Couper, Belknap, Staveley.

CONSTITUTIONAL LAW—Dean WALTON.

Wainwright and Ogden and Duff, equal; Cotton, Gariépy, Astle, Aylmer, Brown, Vipond, Bonin, Staveley, Belknap, Couper.

LEGAL HISTORY—Prof. MCGOUN.

Wainwright, Gariépy, Cotton, Ogden, Brown, Duff, Astle, Bonin, Aylmer, Couper, Vipond, Belknap, Staveley.

REAL RIGHTS—Prof. MARLER.

Wainwright; Vipond and Astle, equal; Cotton, Staveley, Duff, Gariépy, Aylmer, Ogden, Brown, Couper, Bonin.

LAW OF PERSONS—Prof. LAFLEUR.

Wainwright, Astle, Ogden, Cotton, Gariépy; Couper and Duff, equal Bonin, Vipond, Brown, Aylmer and Belknap, equal; Staveley.

LAW OF OBLIGATIONS—Mr. Aimé Geoffrion.

Ogden; Wainwright and Cotton, equal; Astle, Duff, Gariépy, Bonin Aylmer, Vipond, Staveley, Brown, Belknap, Couper.

CIVIL PROCEDURE—Mr. Gordon W. Macdougall.

Ogden and Wainwright, equal; Astle, Couper, Gariépy, Cotton, Duff, Vipond, Bonin, Aylmer, Brown, Belknap, Staveley.

The Special Prizes in Roman Law were awarded as follows:
1 Wainwright.
2 Cotton and Ogden, equal

FACULTY OF COMPARATIVE MEDICINE AND VETERINARY SCIENCE.

PRIZES.

Veterinary Medicine and Surgery—B. F. Humphries.
Anatomy—Geo. Kennedy.
Cattle Pathology—B. F. Humphries.
Pharmacology and Therapeutics—B. F. Humphries.
Biology or Botany—A. D. Harrington.

EXTRA PRIZES.

For the best essay read before the Veterinary Medical Aasociation—1st, B. F. Humphries; 2nd, F. T. Allen.

FACULTY OF ARTS.

GRADUATING CLASS.

B.A. Honours in Mathematics and Natural Philosophy.

Johnson, J. Guy Watts—First Rank Honours and Anne Molson Gold Medal.
Radford, E. Alan.—Second Rank Honours.

B.A. Honours in Classics.

Radford, E. Alan.—First Rank Honours and Chapman Gold Medal.
Willis, S. J.—First Rank Honours and Medal Prize.
Garlick, Edythe.—First Rank Honours.
Forbes, Wilfrid M.—Second Rank Honours.

B.A. Honours in Geology, Mineralogy and Palæontology.

Newson, Wm. V.—First Rank Honours.
Marcuse, Bella.—First Rank Honours.
Cochrane, Donald.—Second Rank Honours.

B.A. Honours in Mental and Moral Philosophy.

MARCUSE, BELLA.—First Rank Honours and Prince of Wales Gold Medal.

MCGREGOR, CLAIRE R.—First Rank Honours and Medal Prize.

COOK, LESTER H.—First Rank Honours.

CROWELL, BOWMAN C.—First Rank Honours.

COHEN, ABRAHAM.—Second Rank Honours.

HARDY, CHS. A.—Second Rank Honours.

B.A. Honours in English Language, Literature and History.

NITTER, J. APPLETON,—First Rank Honours and Shakspere Gold Medal.

WOODLEY, EDWARD C.—First Rank Honours.

WEINFIELD, HENRY.—First Rank Honours.

ROEKE, HELEN.—Second Rank Honours.

MCMILLAN, CYRUS J.—Second Rank Honours.

JACKSON, E. GERTRUDE.—Second Rank Honours.

B.A. Honours in Modern Languages and History.

DEY, M. HELENA.—First Rank Honours and Minto Gold Medal; Alliance Française Silver Medal.

First Rank General Standing.

FERGUSON, COLIN C.—Hiram Mills Gold Medal. Special Certificate.

ELDER, ROBT.—Special Certificate.

ROWELL, ARTHUR H.—Alliance Française Bronze Medal. Special Certificate.

THIRD YEAR.

BARRINGTON, FRED. H.—First Rank Honours in Mathematics and Natural Philosophy and Prize; First Rank General Standing; Prize in Latin.

WILLIAMS, HENRY S.—First Rank Honours in Mental and Moral Philosophy and Prize; First Rank General Standing; Prize in Latin.

MCLEOD, ANGUS B.—First Rank Honours in Mental and Moral Philosophy; First Rank General Standing; Prize in Hebrew.

BENNETT, WINIFRED C.—First Rank Honours in Modern Languages and History; First Rank General Standing; Prize in French.

PAGE, HARRIET.—First Rank Honours in Modern Languages and History, Alliance Française Bronze Medal; Prize in German.

MCDONALD, JOHN.—First Rank Honours and Prize in English Language, Literature and History.

COLEMAN, JOS. H.—First Rank Honours in Classics.

CHPMAN, WARWICK F.—First Rank Honours in Mental and Moral Philosophy.

FLNT, MARY F.—Second Rank Honours in Mental and Moral Philosophy.

MCNAUGHTON, WM. G.—Second Rank Honours in Natural Science; Prize in Botany; Prize in Zoology.

TEES, FRED.—Second Rank Honours in English Language, Literature and History.

MITCHELL, SYDNEY—Second Rank Honours in English Language, Literature and History.

LOCHEAD, ARTHUR W.—Second Rank Honours in English Language, Literature and History.

DICKSON, NORVAL.—First Rank General Standing; Prize in Greek.

COTTON, WM. U.—Prize in Sanscrit.

THIRD YEAR.

PASSED THE SESSIONAL EXAMINATION.

Barrington, Williams; Dickson and McLeod, equal; Bennett, Fuller, Page, Tees, McNaughton, Flint, Lindsay; Copeman and Harper and McMurtry (S. O.), equal; Charters and McDonald, equal; Cotton and Scrimger, equal; Hickson, Moffatt and Huxtable, equal; Chipman, Molson, Mitchell (S.), Stephens, Lochead.

STUDENTS REGISTERED IN THE MEDICAL FACULTY.

Arranged alphabetically.

Boulter, McEwen, McPherson, Mitchell (I.), Strong.

SECOND YEAR.

CROWELL, SAMUEL G. (Yarmouth Academy, N. S.)—First Rank Honours and Prize in Mathematics; First Rank General Standing.

MUNN, W. CLEMENT (Quebec H. S.)—Second Rank Honours in Mathematics, First Rank General Standing; Prize in Sanscrit; Prize in English.

HARRIS, SPENCER L. DALE (Private Tuition)—First Rank General Standing.

IRVING ELIZABETH (Prince of Wales College, P. E. I.)—First Rank General Standing; Prize in German.

NOLAN, ANNIE W. (Westmount Academy)—First Rank General Standing; Prize in Chemistry.

PRUYN, WM. G. (Napanee Coll. Inst.)—First Rank General Standing; Prize in Chemistry.

PLANT, VERNER L.—First Rank General Standing; Prize in English; Prize in French.

CARSON, HERMAN A.—Prize in Hebrew.

SECOND YEAR.

PASSED THE SESSIONAL EXAMINATION.

Class I.—Crowell, Harris, Irving, Nolan and Plant and Pruyn, equal; Munn.

Class II.—Carlyle and Murphy, equal; Dixon, Warriner; Hitchcock and Jack and McDonald, equal; McLachlan, Clogg and Ellison, equal; Walker; Cole and Miller (†) and Smith, equal; Bickerdike.

Class III.—Carson and Greenleese and Muir, equal; Munn (†), Ascah; Fox and Crothers, equal; Adams, Blagrave (*s*), Day (*s*), Ireland (*s*), Ogilvie (*s*) Parker (*s*)

(*s*).—With Supplemental examination in one subject (arranged alphabetically).

FIRST YEAR.

MacMillen, Henry G. (Prince of Wales Coll. P.E.I.)—First Rank Honours in Mathematics and Prize.

Lundie, Helen (Montreal H. S.)—First Rank Honours in Mathematics and Prize; First Rank General Standing; Prize in Greek.—Prize in Latin.

Wisdom, Katharine (St. John H. S., N.B.)—First Rank Honours and Prize in Mathematics; First Rank General Standing; Prize in German; Coster Memorial Prize.

McLeish, John (Private Tuition)—First Rank Honours in Mathematics; First Rank General Standing.

Healey, Walter Joseph (St. Francis College School)—First Rank General Standing.

Dickson, Ada D. (Pembroke High School)—First Rank General Standing.

Couture, Gui. C. (Montreal H. S.)—Prize in English and History.

Angus, Jean M. (Westmount Academy)—Prize in Greek.

Parkin, Maude E.—Prize in French.

FIRST YEAR.

PASSED THE SESSIONAL EXAMINATION.

(1) For course leading to B.A.

Lundie, Wisdom, Healy, Dickson, Davidson and Seaman, equal; Parkin (M.) and Wales, equal; Holman, Angus and Lomer, equal; Couture, Joseph, Paul §, Anderson and Belyea and Harris and Troop, equal; Cole ‡, McMorran, Mackay, Pattison, Hadrill, Burpee § and Campbell § and Philip §, equal; MacMillen, East and Parkins (E.), equal; Dutaud, Budyk, Simister, Bridgettes ‡, Cameron (*s*), Fripp (*s*), Gnaedinger (*s*), Hannington (*s*), McConaghy ‡ (*s*), Pownall (*s*).

(2) For course leading to B.Sc.

McLeish, Dunlop (*s*).

(*s*) With Supplemental examination in one subject (arranged alphabetically).

SUPPLEMENTAL EXAMINATIONS.

PASSED.

September to Christmas, 1899.

(*a*) *Supplemental Sessional.*

Third Year—Reford (L. L.), Perley, (F. B.)

Second Year—Brodie (H. H.), McMurtry (G. O.), McMurtry (S. O.), Mowatt (J. A.), Mount (H. P.), Scott (W. J.).

First Year—Crothers (H. R.), McDonald (J. A.), Greenleese (W. S.), Baillie (M. I.).

(*b*) *Supplemental in one Subject.*

Second Year—Charters (H.), Chipman (W. F.), Huxtable (G. M.), Molson (P.).

First Year—Ascah (R. G.), Blagrave (R. C.), Browne (H. D.), Eaton (C.), Ogilvie (G. L.).

† Morrin College.
‡ Stanstead Wesleyan College.
§ Vancouver College.

STANDING IN THE SEVERAL SUBJECTS.

STUDENTS OF EQUAL STANDING ARE BRACKETED TOGETHER.

B. A. ORDINARY.

GREEK.

Class I.

Willis
Radford,
Garlick,
Ferguson.

Class II.

Smith, L. A.

Class III.

Forbes,
Ainley.

LATIN.

Class I.

Ferguson, *
Radford,
Willis,
Garlick.

Class II.

Rowell,
Smith,
Holman, }
Lundie, }
Ells,
Forbes.

Class III.

Crack,
Grier,
McKinnon,
Perley,
Duguid,
Fyles. †

MECHANICS.

Class I.

Elder,
Ferguson, }
Lee, }
Cochrane,
Nutter,
Rowell,
Smith,
Mackinnon.

Class II.

Hardy,
Ells,
Ainley,
Grier.

Class III.

Millar,
Fyles,†
MacMillan,
Learmonth,
Newson,
Stewart,
Smith,
Duguid,
Laverie,
Dewitt.

BOTANY.

Class I.

Class II.

Class III.

Reford, L.

ASTRONOMY AND OPTICS.

Class I.

Elder, }
Johnson, }
Rowell,
Radford,
Lundie,
Ferguson,
Holman.

Class II.

Cooke,
Crack.

Class III.

Smith,
Perley,
Fyles,
Duguid,
Scott.

EXPERIMENTAL PHYSICS.

Class I.

None.

Class II.

Johnson,
Radford.

Class III.

Scott.

LABORATORY COURSE.

Class I.

Scott

Class II.

Radford
Johnson

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* Distinction in Examinations.
† Morrin College.
‡ Stanstead Wesleyan College.
§ Vancouver College.

B. A. ORDINARY.

MORAL PHILOSOPHY.

Class I.

Marcuse,
Rowell,
Millyard,
Ferguson,
Lee, }
McGregor, }
Elder,
Sawyer, }
Smith, }
Crowell,
Cooke.

Class II.

Dixon,
Rowan,
Walker,
Crack, }
Lamb, }
Hamilton,
Cohen,
Ainley,
Scott, H. E.,
Fyles,
Hardy }
Laverie, }
Mackinnon, }
Perley, }
Clarke,
Coone, }
Greenaway. }

Class III.

Ells.
Grier, }
Lloyd, }
Lundie, }
Mathieson, }
Vickery, }
Holman,
Woodley,
Stweart,
Turkington,
Swinton,
Ashton,
Bailey, }
Barker, }
Ritchie, }
Duguid.

ENGLISH.

Class I.

Ferguson,
Nutter,
Ells,
Grier,
Rowell,
Woodley,
Scott,
Smith,
Holman,
Johnson, H. (B.A.).

Class II.

Keith, }
McGregor, }
Perley, }
Ainley, }
Macmillan, }
Rorke, }
DeWitt, }
Jackson, }
Duguid.

Class III.

Mackinnon, }
Millar, }
Weinfeld, }
Fyles † }
Laverie, }
Lundie. }

FRENCH.

Class I.

Rowell,
Dey,
Ritchie,
Elder,
Johnson, H. (B.A.),
Holman,
Cohen,
Dixon.

Class II.

Crowell,
Walker,
Jackson,
Weinfeld,
Rorke.

Class III.

Crack,
Reford.

GERMAN.

Class I.

Dey,
Fyles †
Ferguson.

HEBREW.

Class I.

None.

Class II.

Lee, H. S.,

Class III.

Stewart, D.

GEOLOGY.

Class I.

Marcuse,
Newson,
Elder,
Cochrane,
Keith,
McKinnon,
Ainley, }
Reford, }

Class II.

Lundie,
Ells,
Stewart,
Crack,
Laverie,
Lee,
Swinton,
Perley.

Class III.

Mathieson,
Miller.

ZOOLOGY.

Class I.

Grier.

Class II.

Ainley.

Class III.

Reford.

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* Distinction in Examination.
† Morrin College.
‡ Stanstead Wesleyan College.
ℓ Vancouver College.

THIRD YEAR.

GREEK.

Class I.

Dickson * (Prize),
Barrington,
Copeman.

Class II

Jeakins, }
Cotton. }

Class III.

Mount,
Fuller.

LATIN.

Class I.

Williams, *(Prize).
Barrington, (Prize)
Dickson,
Copeman.

Class II.

Harper,
Lindsay,
Cotton,
Brown,
Flint, }
Hickson, }
Fuller, }
Smith,

Class III.

Mitchell,
McMurtry, S. O.,
Scott,
Chipman,
Moffatt,
Stephens,
McMurtry, G. O.,
Molson,
Scrimger,
Fraser,
Huxtable,
Laverie,

MECHANICS.

Class I.

McLeod,
McPherson, }
Barrington, }
McEwen,
Molson,
Williams.

Class II.

Fuller,
Tees,
Moffatt,
Dickson, }
Smith, † }
Charters,
Flint,
Hickson, }
McMurtry, }
McDonald, }
Mitchell, I. E.,
Viner,
Huxtable,
Bennett.

Class III.

McNaughton,
Lindsay,
Cotton,
Scrimger,
Harper,
Strong,
Page, }
Fraser, † }
Jeakins, }
Scott, }
Lochead, }
Stephens, }
Brodie, }
Chipman,
McMurtry, G. O.,
Boulter,
Mitchell, S.,
Copeman.

ASTRONOMY AND OPTICS.

Class I.

Barrington,
Flint,
Charters,
McMurtry, G.,
Fuller,
Dickson,
McLeod.

Class II.

Cotton,
Smith,†
McDonald,
Hickson,
Huxtable, }
Lindsay, }
Tees,
Harper,
Mowatt,
Stephens.

Class III.

Molson, P., }
Fraser, † }
Mitchell, S.,
Viner,
Brown, }
Lochead, }
Chipman,
White.

EXPERIMENTAL PHYSICS.

Class I.

Barrington,
Tees.

LABORATORY COURSE.

Class II.

Barrington,

Honours in Mathematics and Natural Philosophy.

BARRINGTON, F. H.—First Rank Honours.

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* Distinction in Examination.
† Morrin College.
‡ Stanstead Wesleyan College.
§ Vancouver College.

THIRD YEAR.

ENGLISH.

Class I.

Harper,
Tees.

Class II.

Lindsay,
Copeman, }
Smith † }
Lochead,
McDonald,
Chipman,
Charters, }
Molson. }

Class III.

White,
Mitchell,
Mowatt, }
Fraser }
Flint.

METAPHYSICS.

Class I.

Williams,
Johnson, H. (B.A.),
McEwen,
Chipman, }
Flint, }
MacLeod,
Hickson,
McMurtry, S. O,
Lindsay.

Class II.

Fuller, }
Sawyer, }
Dickson,
Cotton, }
Scrimger, }
Viner,
Boyd, }
Mount. }

Class III.

Charters, }
Greenaway, }
Sutcliffe,
Mowatt, }
Ashton, }
Stillmann,
McKelvey,
Stephens.

FRENCH.

Class I.

Bennett,
Page,
William.

Class II.

Dickson,
Huxtable,
Hickson,
Mitchell,
McDonald,
Brodie.

Class III.

Stephens,
Strong,
Moffatt,
White,
Barrington,
Fuller,
MacNaughton,
Molson,
McMurtry (G.)
McPherson,
Harper.

GERMAN.

Class I.

Page,
Bennett.

Class II.

Mitchell (I. E.),
Huxtable.

Class III.

Boulter,
Scott.
Lochead,

HEBREW.

Class I.

MacLeod, A. B. (Prize).

Class II.

Brown, A. V.

Distinction in Examination.
† Morrin College.
‡ Stanstead Wesleyan College
§ Vancouver College.

THIRD YEAR

ZOOLOGY.

Class I.

McNaughton.

Class II.

McMurtry, S. O.,
Brodie,
Moffatt,
Scrimger.

BOTANY.

Class I.

McNaughton,
Fuller,
Scrimger,
Page,
Craig,
Bennett.

Class II.

Brodie.

SECOND YEAR.

GREEK.

Class I.

Crowell,
Munn, W. C.,
Warriner.

Class II.

Jack,
Carlyle,
Clogg,
Fox.

Class III.

Miller †
Smith, M. G.,
Munn, M., †
Day,
Carson.

LATIN.

Class I.

Plant,
Murphy,
Crowell,
Irving,
Harris,
Smith.

Class II.

Ellison,
Carlyle,
Jack,
Munn,
Dixon,
Muir,
Nolan,
Ogilvie,
Warriner,
Pruyn,
McDonald.

Class III.

Cole,
Hitchcock,
Bickerdike,
Miller, †
Fox,
Munn, †
Clogg,
McLachlan,
Greenleese,
Day,
Adams,
Ascah,
Blagrave,
Crothers.

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* Distinction in Examination.
† Morrin College.
‡ Stanstead Wesleyan College.
§ Vancouver College.

SECOND YEAR.

SOLID GEOMETRY, CONIC SECTIONS AND DYNAMICS.

Class I.

Crowell, Pruyn,
Harris,
Miller,†
McDonald,
Plant.

Class II.

Clogg,
Munn,†
Ellison,
Dixon,
Nolan,
Munn.

Class III.

Cole,
Warriner,
Baillie,
Ascah,
Fox,
Adams, Muir,
Smith.

ALGEBRA AND SPHERICAL TRIGONOMETRY.

Crowell, Pruyn,
Harris, McDonald,
Munn,
Dixon,
Nolan.

Class II.

Warriner,
Plant,
Adams, Clogg,
Muir.

Class III.

Fox,
Cole,
Smith,
Ogilvie, Miller,
Ellison,
Munn,†
Baillie,
Ascah.

LOGIC.

Class I.

Carlyle,
Crowell,
Dixon, Plant,
Munn, Nolan,
Warriner.
Harris,
Irving.

Class II.

Blagrave,
Miller,†
Hitchcock, Pruyn,
Day, Bickerdike,
Clogg,
Ascah, Jack,
Cole, Ellison,
McDonald, McLachlan,
Walker.

Class III.

Greenleese,
Adams,
Muir,
Parker,
Woodside,
Smith,
Boyd,
Carson, Ireland,
Munn,†
Mitchell, Noyes,
Browne, Crothers,
Fox,
Wotherspoon,
Price,
Baillie,
Stillman.

Honours in Mathematics.

CROWELL, — First Rank and Prize. MUNN, — First Rank.

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* Distinction in Examination.
† Morrin College.
‡ Stanstead Wesleyan College
§ Vancouver C

SECOND YEAR.

ENGLISH LANGUAGE AND LITERATURE.

Class I.

Munn, W., Plant, Harris, Carlyle, Irving, Nolan.

Class II.

Crowell, Clogg, Dixon, Murphy, Pruyn, Warriner, Bickerdike, Smith, Jack, McDonald, McLachlan, Cole, Ellison, Munn, E., †, Hitchcock, Muir, Day.

Class III.

Cusson, Adams, Parker, Crothers, Kingsley, Ogilvie, Millar, †, Ascah, Price, Blagrave, Baillie, Noyes, Fox, Robertson, Browne.

FRENCH.

Class I.

Plant.

Class II.

Harris, Munn, Ellison, Dixon, Murphy.

Class III.

Crowell, Bickerdike, Ogilvie, Crothers, Cole, Ireland, Muir, Noyes, Irving, Parker, Lacy, Jack, Adams.

PASSED.

Munn, †, Miller. †

GERMAN.

Class I.

Irving, Hitchcock.

Class II.

McLachlan.

Class III.

Greenleese.

CHEMISTRY.

Class I.

Nolan, A. (Prize), Pruyn, (Prize), Harris, Irving, Walker, Dixon, Hitchcock, McLachlan.

Class II.

McDonald, Murphy, Carlyle, Carson, Crothers, Greenleese, Ogilvie.

Class III.

Bickerdike, Cole, Price, Wotherspoon.

HEBREW.

Class I.

Blagrave, Matheson, Ireland, Carson, (Prize.), Jack, Parker.

Class II.

Touchette, Ascah,

Class III.

Greig, Turkington, Cruchon, Swinton, Morrow.

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* Distinction in Examination.
† Morrin College.
‡ Stanstead Wesleyan College.
§ Vancouver College.

SECOND YEAR.

BIOLOGY AND DYNAMICS.

Class I.

Murphy.

Class II.

Dixon,
Nolan,
McDonald.

Class III.

Greenleese,
Walker,
Wotherspooon.

FIRST YEAR.

GREEK.

Class I.

Lundie Prize),
Angus Prize),
Healy,
Seaman,
Mackay,
Dease,
Pownall.

Class II.

Holman,
Davidson,
Troop,
Lomer,
Paul, §
East.

Class III.

Pattison,
Joseph,
McMorran,
Hadrill,
Dutaud,
Woodley,
Burpee, §
McMillen,
Mowatt.

LATIN.

Class I.

Lundie* (Prize),
Wisdom,
Dease,
Seaman,
Belyea,
Lomer,
Dickson,
Pownall,
Healy,
Wales,
Couture,
Hanington,
Angus,
Parkin.

Class II.

Joseph,
Harris,
Hogan, } equal
Hunter, }
Burpee, §
Davidson,
Johnson, } equal
Pattison, }
Troop,
Paul, §
Snaith, †
Cameron, } equal
McMillen, }
Raymond, †
McMorran, } equal
Simpson, }

Class III.

Lockhart, ‡
May,
East, } equal
Hadrill, }
Sutherland,
Holman,
Fripp,
Bridgette, ‡
Anderson,
Philp, §
Dutand,
Cole, ‡
Budyk, } equal
Parkins, }
Simister,
Campbel

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* Distinction in Examination.
† Morrin College.
‡Stanstead Wesleyan College.
§ Vancouver College.

FIRST YEAR.

GEOMETRY AND ARITHMETIC.

Class I.

McLeish,
Cameron, Wisdom,
Holman,
Lundie,
Healy,
Harris
Dickson, McMorran, Seaman,
Gnaedinger,
Anderson,
MacMillen.

Class II.

Hadrill, Ford§, Campbell§,
Belyea
Philip§
Halfpenny, Lomer, Paul§,
Cole†,
East,
Graham,‡ Bridgette†,
Sims,
Snaith†,
Wales,
Howard, Burpee§,
Davidson,
Pattison,
Joseph,
Gass,
Mowatt.

Class III.

May, Parkins,
Couture, Pownall,
Hanington, McCraken, MacKay,
Davies,
Dutaud,
Troop,
Simpson,
Dunlop,
Hogan,
Angus, Parkin (M.),
Lochart†,
Hunter,
Gray,
Simister,
Raymond†,
Fripp,
Johnson,
McConaghy§,
McLeod,
Philps,
Budyk.

TRIGONOMETRY AND ALGEBRA.

Class I.

McLeish,
Dickson,
Angus,
Lundie,
Healy,
Davidson,
Burpee.

Class II.

Gnaedinger,
Philip, §
Dunlop, Hannington, Campbell, §
Joseph, Parkin M.,
Anderson,
Howard,
Mowatt, Wisdom,
Couture, Harris, Gass,
May,
Holman, Hogan,
Seaman,
McCraken, Pattison,
Cole, ‡
McKay, McMorran,
East.

Class III.

Hadrill, Woodley,
Parkins (E.),
Fripp, McMillan, Wales,
Simister,
Sutherland, McLeod,
Halpenny, Duncan, Philp, Bridgette, ‡
Lomer, Ford, §
Paul, § McConaghy, §
Budyk, Snaith †
Graham, ‡ Davies, Dutand,
Sims, Lockhart, ‡
Cameron, Belyea,
Hunter,
Troop,
Pownall.

PHYSICS.

Class I.

Holman,
Healy,
Davidson,
Anderson, Lundie, McLeish, Cameron.

Class II.

Halpenny, Wales,
Dickson,
Pattison, Wisdom,
Burpee,§
Paul, § Philip, §
Harris,
Parkin,
Lockhart, ‡ Mackenzie, Pownall, Troop,
Gnaedinger,
Snaith, W., †
Macmillen.

Class III.

Hadrill,
Campbell,§
Ford,§
Howard, Lomer, Seaman,
Snaith, †
Hogan,
Gray, McMorran,
Bridgette, ‡
Dunlop, Gass, Joseph,
Belyea,
Cole, ‡ May, MacKay, Sutherland,
Fripp,
Angus,
Mowatt,
Couture,
Raymond, †
Parkins,
Sims,
Mackellar,
East, Johnson,
Simpson,
Budyk, Simister,
Dutaud.
McConaghy, §

SANSKRIT.

Class I.

Munn, W. C., Cotton, W. U., (Prizes)
Carr, Muriel, B.A.

Advanced Section in Mathematics. First Rank Honours.

McMillen, (Prize). Lundie, (Prize). Wisdom, (Prize). McLeish.

* Distinction in Examination.
† Morrin College.
‡ Stanstead Wesleyan College.
§ Vancouver College.

FIRST YEAR.

ENGLISH LITERATURE, COMPOSITION AND HISTORY.

Class I.

Couture,
Belyea,
Lomer,
Lundie,
Dease, Joseph, Parkin,
Burpee, Cole, ‡
Wisdom,
Parkins,
Wales,
McLeish,
Paul,
Anderson, Davidson, Johnson, McMorran.

Class II.

Healy,
Gnaedinger,
Dickson,
Hanington, Mackay,
Angus,
Campbell, §, Hadrill, McKeller, Philip, §
Seaman,
Troop,
Fripp,
Holman, McDougall,
Cameron, Duncan,
Snaith,
Dutand, Harris,
Bridgette, ‡ Ford,
May,
Howard, McMillan, Lockhart, Sims.

Class III.

Gass,
Hogan, Pattison,
Halpenny, Woodside,
Gray, Simister,
McLeod, Raymond, †, Philps, Sutherland,
Woodley,
McConaghy, §
Dunlop,
East, MacKenzie,
Budyk.
Graham, ‡

FRENCH.

Class I.

Parkin,
Lundie,
Lomer,
Wisdom.

Class II.

Joseph,
East,
Angus,
Belyea,
Wales,
Dutaud,
Healy,
McLeish,
Dickson.

Class III.

Mackay,
Philip, §, Parkins,
Hanington,
Hadrill, Campbell, §
Simpson,
Gass,
Harris,
Pattison,
Budyk,
Simister,
Gnaedinger,
Anderson,
Dunlop,
McConaghy, §

GERMAN.

Sec. A

Class I.

Wisdom
Dickson,
Parkin,
Wales.

Class II

Cox,
Belyea.

Sec. B.

Class I.

Budyk.

Class II.

Couture,
McLeish,
Gass.

Class III.

Duncan, Hanington, Gnaedinger.

PHYSICAL CULTURE.

Royal Victoria College.

HELENA M. DEY..... ....4th Year Arts, Prize

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* Distinction in Examination.
† Morrin College.
‡ Stanstead Wesleyan College.
Vancouver College.

FACULTY OF APPLIED SCIENCE.

GRADUATING CLASS, 1900.

ALLEN, SAMUEL JAMES.—British Association Medal and Prize; Scott Exhibition of $50; Honours in Electrical Measurements, Electrical Laboratory Work and Electrical Designing.

ANDREWES, EDWARD.—Honours in Mining, Laboratory Work and Ore Dressing.

BYERS, ARCHIBALD FULLARTON.—The Waddell & Hedrick Prize of $50 for the best bridge design; Prize for Summer Thesis; Honours in Designing.

CORNWALL, CLEMENT ARTHUR KINGSCOTE.—Honours in Electrical Designing.

CORRIVEAU, RAOUL DE BESSERER.—Third Carlyle Prize of $20; Prize for Summer Thesis; Honours in Mining Laboratory Work.

COWANS, FREDERICK.—Honours in Metallurgy.

DUNCAN, GAYLEN RUPERT.—Honours in Electrical Measurements, Electrical Engineering Laboratory Work, Electric Railway Work and Electro-Chemistry.

EWART, GEORGE ROBERT.—Prize for Summer Thesis; Honours in Geodesy, Geodetic Laboratory Work and Railway Engineering.

GILLEAN, ROBERT HAMPSON.—British Association Medal and Prize; First Carlyle Prize of $75; Fraser & Chalmers Prize of $25 for Mining Laboratory Work; Honours in Metallurgy and Mining Laboratory Work.

GLASSCO, JACK GIRDLESTONE.—Honours in Electrical Engineering Laboratory Work.

LEMAN, BEAUDRY.—Honours in Mining Engineering Laboratory Work.

MILLER, ANGUS KENNETH.—Honours in Alternating Current Work (theoretical and practical).

MOORE, ERNEST VIVIAN.—Honours in Ore Dressing and Mining Design.

NELSON, GEORGE JOHN.—British Association Medal and Prize; Honours in Alternating Current Work (theoretical and practical); Electrical Measurements, Electro-Chemistry, Electrical Engineering Laboratory Work, Electrical Designing and Electric Railway Work.

ROBERTSON, PHILIP WILLIAM KATTHAIN.—Dawson Fellowship; Second Carlyle Prize of $30; Honours in Metallurgy and Mining Laboratory Work.

THIRD YEAR.

Archer, Augustus R.—McCarthy Prize for Field Work; Third Mathenatical Prize; Prize in Graphical Statics.

Burson, Herbert A.—British Columbia Graduates' Society Prize; Prizes in Direct Current Machinery, Dynamo Laboratory Work, and in Mathematics.

Clement, Sheldon B.—McCarthy Prize for Field Work; Prizes in Surveying, Practical Astronomy, Road Construction, Descriptive Geometry and Elementary Design.

DeBlois, William H.—Prizes in Practical Chemistry and Metallurgy.

Edwards, William Muir.— First Mathematical Prize; Prize in Ore Dressing.

Glassco, Archie P. S.—Prize in Dynamics of Machinery.

McLaren, John H.—Prizes in Direct Current Machinery, Dynamo Laboratory Work, Testing Laboratory, Machine Design and Theory of Structures.

Paterson, Charles S.—Prizes in Mineralogy, Geology and Metallurgy.

Ward, Percy W.—Prize in Mechanical Drawing.

PASSED THE SESSIONAL EXAMINATIONS.

(In Order of Merit.)

CIVIL ENGINEERING.

Clement, Sheldon B., Clinton, Ont.
*Blanchard, Arthur C. D., Windsor, N. S.
*Gagnon, Edmund E., Westmount, Que.

ELECTRICAL ENGINEERING.

Burson, Herbert A., St. Catherines, Ont.
McLaren, John H., Montreal, Que.
Taylor, Charles W., Richwood, Ont.
*Howard, Rupert F., Lachine, Que.
Glassco, Archie P. S., Hamilton, Ont.
Scott, Henry M., Montreal.
Ward, Percy W., Lachine, Que.
*Forman, Andrew S., Montreal.
*Coussirat, Henri A., Montreal.
Boyd, Hugh H., Montreal
*Lloyd, Herbert M., New Westminster, B. C.

MECHANICAL ENGINEERING.

Wilson, Reginald C., Cumberland, Ont.
Schwitzer, Thomas H., Ottawa, Ont.
*Cameron, Hugh D., Montreal, Que.
*Burwell, Ernest V., London, Ont.
*Lowden, Warden King, Montreal.
*Hampson, E. Greville, Montreal.
*Pyke, Gordon McT., Montreal.

MINING ENGINEERING.

Archer, Augustus R., New York, U.SA.
Edwards, William M., Ottawa, Ont.
*Fraser, Donald C., New Glasgow, N. S.
*Ritchie, Joseph N., Halifax, N. S.
*Frechette, Howells, Ottawa, Ont.
*Ogilvie, Paul, Cumming's Bridge, Ont.
*Palmer, Ernest E., Toronto, Ont.
*McKenzie, Bertram S., London, Ont.
*Galbraith, Malcolm T., Montreal.
*Tupper, Charles, Vancouver, B. C.
*White, Gerald V., Pembroke, Ont. (aegrotat)

PRACTICAL CHEMISTRY.

Paterson, Charles S., Montreal.
DeBlois, William H., Halifax, N. S.

SECOND YEAR.

Corless, Charles V.—Scott Exhibition; Prizes in Chemistry, Mathematics, Physics and Surveying.

De Pencier, Henry P.—Scott Prize of $15; Prize in Mechanical Drawing.

Heaman John A.—Prize for Mapping.

Robertson, John F.—Prizes in Chemistry, Descriptive Geometry and Physics.

Sterns, Frank E.—Scott Prize of $25; Prizes in Descriptive Geometry and Physics.

PASSED THE SESSIONAL EXAMINATIONS.

(In Order of Merit.)

CIVIL ENGINEERING.

Heaman John A., London, O.
Bigger, Howell, Ottawa, Ont.
Borden, Henry P., Kentville, N. S.

ELECTRICAL ENGINEERING.

Scott, Harry E., Napanee, Ont.
Smith, J. Macdonald, Petitcodiac, N. B.
Hicks, Thomas N., Perth, Ont.
Jackson, Philip T., Toronto, Ont.
Murphy, William E., Shelburne, N. S.
Dunfield, John C. W., St. Johns, Newfoundland.
MacKeen, Rupert T., Windsor, N. S.
*Mackay, Eric, St. Johns, Newfoundland.

MECHANICAL ENGINEERING.

Sterns, Frank E., Morell, P. E. I.
Smith, Gerald M., St. Johns, Que.
Addie, Thomas H., Sherbrooke, Que.
*Newton, Samuel R., Drummondville, Que.
*Baird, Alexander, Sherbrooke,Que.

MINING ENGINEERING.

Corless, Charles V., New Durham, Ont.
Robertson, John F., Charlottetown, P. E. I
De Pencier, Henry P., Vancouver, B. C.
*Barwick, William S., Vancouver, B. C.
*Meyers, Archie J., Listowel, Ont.
*McBride, Wilbert G., Inglewood, Ont.
*Coulson, John L., Toronto, Ont.
*Campbell, Charles McK., Winnipeg, Man.

PRACTICAL CHEMISTRY.

*Cape, Ernest K., Hamilton, Ont.

FIRST YEAR.

Foreman, Alvah E.—Prizes for Descriptive Geometry, English, Mathematics and Physics.
Hall, Oliver.—Prize for English.
Jones, Harold W.—First Hutchison Prize for Freehand Drawing and Lettering.
McCaskill, Kenneth.—Second Fleet Workshop Prize.
McKay, Frederick A.—Prize for Descriptive Geometry, First Fleet Workshop Prize; Second Hutchison Prize for Freehand Drawing and Lettering.

PASSED THE SESSIONAL EXAMINATIONS.

(In Order of Merit.)

Foreman, Alvah E., Vancouver, B. C.
Hall, Oliver, Washington, Ont.
Roberts, Arthur R., Montreal.
McKay, Frederick A., Montreal.
Boright, Sherman H., Sutton, Que.
Brown, Frederick B., Montreal.
Jones, Harold W., Ottawa, Ont.
Cooper, Frank W., London, Ont.
†McCaskill, Kenneth, Barb, Ont.
Peaslee, Alexander S. L., Defiance, Ohio, U. S. A.
Richards, Charles C., Charlottetown, P. E. I.
Hayes, Albert O., Granby, Que.
Keith, Fraser S., Smith's Falls, Ont. } equal
Tilt, Edwin B., Goderich, Ont. }
Rodger, Herbert F., St. Johns, Newfoundland.
Gale, George G., Quebec, Que.
†Gillies, George A., Carleton Place, Ont. } equal
Rowlands, Charles, Albany, N. Y., U. S. A. }
Graham, William E., Dundas, Ont.
Stovel, Joseph H., Coraopolis, Pa., U. S. A.
†McDonald, James F., Westville, N. S.
†Anderson, Lewis B., Lunenburg, N. S.
†Kendall, George., Vancouver, B. C.
Blatch, Harry E., St. Johns, Newfoundland.
Ross, James G., Embro, Ont. } equal
Trimingham, Charles L., Barbadoes, W. I. }
Thorpe, William H., Montreal.
*†Morse, William H., Bridgetown, N. S.
Musgrave, Robert, Duncans, B. C.
*McKergow, Charles M., Westmount, Que.
Baker, William E., Montreal.
Cohen, Harris, Montreal.
*†Fraser, Thomas C., New Glasgow, N. S.
†Lambart, Howard F., New Edinburgh, Ont.
James, Bertram, Heart's Content, Newfoundland.
*Cole, G. Percy, Montreal.
*Langley, Albert G., Victoria, B. C.
*Pemberton, William P. D., Gonzales, Victoria, B. C.
*Musgrave, William N., Duncans, B. C.
*Oakes, Francis H., Boston, Mass., U. S. A.
*Yuile, Herbert, Montreal.
*Denne, Reginald D. L., Montreal.
*†Porter, William J. D. A., Douglastown, N. B.
*Landry, Pierre A., Dorchester, N. B.
*Barclay, Malcolm D., Montreal.
*†Cameron, John A., Hamilton, Ont.

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*To pass Supplemental examinations.
†Matriculation conditioned.

STANDING IN THE SEVERAL SUBJECTS.

ALTERNATING CURRENT MACHINERY.

FOURTH YEAR.—*Class I.*—Nelson, Miller (A. K.), Allen, St. George, Cornwall. *Class II.*—Montgomery, Duncan, Glassco (J. G.). *Class III.*—Fraser, (J. W.).

ARCHITECTURAL DRAWING AND DESIGN.

SECOND YEAR.—*Class I.*—None. *Class II.*—None. *Class III.*—Pratt.

ARCHITECTURAL DESIGNING (SESSIONAL WORK).

FOURTH YEAR.—*Class I.*—Northwood.

THIRD YEAR.—*Class I.*—None. *Class II.*—Hutchings, (G. H.). *Class III.*—Hutchings (S. C.).

ARCHITECTURAL DESIGNING (SPECIAL COURSE.)

FOURTH YEAR.—*Class I.*—Staveley.

ARCHITECTURAL DRAWING (SESSIONAL WORK.)

SECOND YEAR.—(*Civil Engineering Course*).—*Class I.*—None. *Class II.*—Bigger. *Class III.*—Beck, Borden.

ARCHITECTURE.

THIRD YEAR.—*Class I.*—Northwood. *Class II.*—None. *Class III.*—Hutchings (G. H.), Hutchings (S. C.).

ARCHITECTURE, ELEMENTS OF.

SECOND YEAR.—*Class I.*—None. *Class II.*—Northwood. *Class III.*—Pratt.*

* Supplemental in Designing.

ARCHITECTURE, HISTORY OF.

THIRD YEAR.—*Class I.*—Northwood. *Class II.*—Hutchings (G. H.). *Class III.*—Hutchings (S. C.).

SECOND YEAR.—*Class I.*—Northwood, *Class II.*—None. *Class III.*—Pratt.

ART HISTORY.

THIRD YEAR.—*Class I.*—Northwood. *Class II.*—Hutchings (G. H.), and Hutchings (S. C.), equal.

ASSAYING (THEORETICAL).

FOURTH YEAR.—*Class I.*—None. *Class II.*—Gillean; Cowans and Leman, equal; Andrewes, Robertson (P. W. K.).—*Class III.*—Donaldson, Corriveau, Moore, Cary, Maclennan, Buchanan, Nicholls.

BUILDING CONSTRUCTION.

SECOND YEAR.—*Class I.*—Heaman, Northwood, Hutchings (G. H.). *Class II.*—Hutchings (S. C.), Bigger, Pratt. *Class III.*—Borden, Beck.

CHEMISTRY.

SECOND YEAR.—(*Special*).—*Class I.*—Heaman.

CHEMISTRY, INDUSTRIAL.

THIRD YEAR.—*Class I.*—Paterson, DeBlois. *Class II.*—Labatt.

CHEMISTRY, INORGANIC.

FOURTH YEAR.—*Class I.*—None. *Class II.*—Barber.

CHEMISTRY, ORGANIC.

THIRD YEAR.—*Class I.*—Paterson. *Class II.*—DeBlois.

DESCRIPTIVE GEOMETRY.

THIRD YEAR.—(*Civil Engineering Course*).—*Class I.*—Clement. *Class II.*—Gagnon, Blanchard.

SECOND YEAR.—*Class I.*—Robertson (F. H.) and Sterns, equal; Corless, Smith (J. M.), Barwick, De Pencier, Heaman, Addie, Smith (G. M.) *Class II.*—Hicks, Jackson, Beck, Meyers, Bigger, Baird. *Class III.*—MacKeen; Campbell and Murphy, equal; Newton, Borden, Dunfield, Mackay (E.).

FIRST YEAR.—McKay (F. A.), Foreman (A. E.), Boright, Hall, McCaskill, Hayes, Cooper, Roberts, Keith, Jones; Graham and McKergow. *Class II.*—Brown and Lambart and Tilt, equal; Morse, Cole; Gale and Kendall, equal; Richards, Denne, Fraser (T. C.), Anderson, Thorpe, Gillies Stovel; McDonald and Ross, equal; Cohen, Pemberton. *Class III.*—Rowlands; Musgrave (R.) and Peaslee, equal; Trimingham, Rodger Baker, Blatch, Gault, Cameron, James.

DESIGNING.

FOURTH YEAR.—(*Civil Engineering Course*).—*Class I.*—Byers, Burgoyne, Ewart. (*Electrical Engineering Course*).—*Class I.*—Allen (S. J.) and Cornwall and Nelson, equal; Duncan and Fraser (J. W.) and Glassco (J. G.) and Miller (A. K.), equal; Montgomery and Shepherd and St George, equal. (*Mechanical Engineering Course*). *Class I.*—Hamilton, Walker. *Class II.*—Smith (G. B.), Arkley, Macmaster. *Class III.*—Neville, Osborne, Sise. (*Mining Engineering Course*).—*Class I.*—Allan (L.); Corriveau and Gillean and Moore, equal; Leman. *Class II.*—Robertson (P. W. K), Cowans, Buchanan. *Class III.*—Nicholls, Stevens.

THIRD YEAR—(*Civil Engineering Course*).—*Class I.*—Clement and Gagnon, equal; Blanchard.

DIRECT CURRENT MACHINERY.

THIRD YEAR.—*Class I.*—Burson, McLaren (J. H.), Coussirat, Scott (H. M.) Taylor. *Class II.*—Glassco (A. P. S.), Howard (R. F.), Boyd. *Class III.*—Ward, Lloyd, Higman, Forman (A. S.)

DYNAMICS OF MACHINERY.

FOURTH YEAR.—(*Electrical Engineering Course*).—*Class I.*—Allen (S. J.). *Class II.*—Glassco (J. G.) and Nelson, equal; Miller (A. K.). *Class III.*—Montgomery, Cornwall, St. George, Duncan, Fraser (J. W.). (*Mechanical Engineering Course*).—*Class I.*—Walker. *Class II.*—Neville, Arkley, Hamilton, Macmaster. *Class III.*—Osborne, Smith (G. B.), Sise.

THIRD YEAR.—*Class I.*—Glassco (A. P. S.), Burson, McLaren (J. H.). *Class II.*—Wilson, Hampson, Taylor. *Class III.*—Ward, Forman (A. S.), Scott (H. M.); Coussirat and Higman, equal; Boyd and Lloyd, equal; Schwitzer, Lowden, Pyke, Cameron.

ELECTRIC LIGHTING.

FOURTH YEAR.—*Class I.*—Allen; Duncan and Nelson, equal. *Class II.*—Glassco (J. G.), Shepherd, St. George, Miller (A. K.). *Class III.*—Cornwall, Fraser (J. W.), Montgomery.

ELECTRICAL MEASUREMENTS.

FOURTH YEAR.—*Class I.*—Allen (S. J.) and Nelson, equal; Duncan. *Class II.*—Cornwall, Glassco (J. G.), Montgomery, St. George, Fraser (J. W.), Miller (A. K.).

ELECTRIC RAILWAYS.

FOURTH YEAR.—*Class I.*—Duncan and Nelson, equal; Allen (S. J.), Fraser (J. W.). *Class II.*—St. George, Miller (A. K.), Glassco (J. G.), Montgomery, Cornwall.

ELECTRO-CHEMISTRY.

FOURTH YEAR.—*Class I.*—Nelson, Duncan, Allen (S. J.). *Class II.*—Cornwall and Fraser (J. W.), and Glassco (J. C.), equal; Miller (A. K.) and Montgomery, equal; St. George.

ELECTRO-MAGNETISM.

THIRD YEAR.—*Class I.*—Burson, McLaren (J. H.), Taylor. *Class II.*—Ward, Glassco (A. P. S.). *Class III.*—Howard (R. F.), Coussirat, Scott (H. M.) Boyd, Forman, Higman.

Special Examination.—Class II.—Lloyd.

ENGLISH.

FIRST YEAR.—*Class I.*—Foreman (A. E.) and Hall, equal; Brown, McKay, Jones; Hayes and Stovel, equal; Boright; Keith and Oakes and Ross, equal; Cohen; McDonald and Peaslee and Trimingham, equal. *Class II.*—Gale and Rodger and Rowlands, equal; Blatch and McKergow, equal; McCaskill; James and Morse and Roberts, equal; Cooper; Tilt and Yuile, equal; Anderson; Gillies and Kendall, equal; Musgrave (R.) and Richards, equal; Baker; Musgrave (W. N.) and Sims and Warrington, equal. *Class III.*—Savage; Denne and Langley, equal; Fraser (T. C.) and Gault and Graham, equal; Barclay, Eaton, Robillard, Lambart; Thorpe and Kerr, equal; Macfarlane, Vallières de St. Real.

FREEHAND DRAWING.

FOURTH YEAR.—(*Architectural Course*).—*Class I.*—Staveley.

THIRD YEAR.—(*Architectural Course.*)—*Class I.*—None. *Class II.*—Northwood.

SECOND YEAR.—(*Architectural Course*).—*Class I.*—Hutchings (G. H.). *Class II.*—Pratt. *Class III.*—Hutchings (S. C.)

FIRST YEAR.—*Class I.*—Jones and McKay (F. A.), equal; Anderson and Cole and Thorpe, equal; Brown and Cooper and Hayes and Morse, equal; McCaskill and Musgrave (R.) and Roberts, equal; McKergow and Robillard, equal; James and Lambart and Tilt, equal; Peaslee. *Class II.*—Graham; Boright and Kendall, equal; Foreman (A. E.) and Hall and Keith, equal; Denne, Gale, Morgan; Langley and Richards, equal; Fraser (T. C.) and Gillies, equal; Baker, Cameron; MacLeod and Musgrave (W. N.) and Savage, equal. *Class III.*—Ross; Blatch and Gault and Rowlands and Stovel, equal; Rodger and Warrington, equal; Cohen and McDonald, equal; Oakes; Sims and Trimingham, equal; Vallières de St Real; Eaton and Yuile, equal.

GEODESY.

FOURTH YEAR.—*Class I.*—Ewart. *Class II.*—None. *Class III.*—Burgoyne, Byers.

GEODETIC FIELD WORK.

FOURTH YEAR.—*Class I.*—Ewart.—*Class II.*—Burgoyne and Byers, equal.

GEOLOGY.

THIRD YEAR.—*Class I.*—Paterson, DeBlois. *Class I.*—Edwards, Ritchie, Archer, Clement, Labatt, McKenzie, Galbraith, Blanchard, Ogilvie. *Class III.*—Blue, Palmer, Frechette, White, Tupper, Flint.

GEOLOGY AND ORE DEPOSITS.

FOURTH YEAR.—*Class I.*—Andrewes, Gillean. *Class II.* Maclennan, Robertson (P. W. K.), Cowans, Corriveau, Leman, Cary, Moore. *Class III.*—Donaldson, Buchanan; Nicholls and Stevens, equal.

GRAPHICAL STATICS.

FOURTH YEAR.—*Class I.*—None. *Class II.*—Burgoyne; Byers and Ewart equal.

THIRD YEAR.—*Class I.*—Archer; Burson and Clement and Frechette, equal; Edwards and McLaren (J. H.) and Scott (H. M.), equal; Burwell, Northwood; Higman and Palmer, equal; Coussirat and McKenzie, equal; Fraser (D. C.) and Schwitzer, equal; Ogilvie and Taylor and Ward, equal.—*Class II.*—Blanchard and Howard (R. F.) equal; Blue; Allan (L.) and Cameron and Ritchie, equal; Boyd and Galbraith, equal; Gagnon; Lowden and Tupper, equal; Flint; Forman (A. S.) and Lloyd and White, equal. *Class III.*—Glassco (A. P. S.); Hampson and Wilson equal; Millar (J.L.), Reynolds, Brecken, Pyke, Burchell.

HYDRAULICS.

FOURTH YEAR.—(*Civil and Mechanical Engineering Courses.*)—*Class I* .—None. *Class II.*—Hamilton, Ewart, Walker, Byers, Arkley. *Class III.*—Neville; Macmaster and Osborne, equal; Burgoyne, Sise, Smith (G.B.). (*Electrical and Mining Engineering Courses.*)—*Class I.*—Allen (S.J.) and Nelson, equal; Gillean, Shepherd, Duncan. *Class II.*—Percy, Cornwall, Glassco (J.G.), Corriveau; Buchanan and Cowans, equal; Miller (A.K.), Robertson (P.W. K.); Moore and St George, equal. *Class III.*—Montgomery; Donaldson and Fraser (J. W.), equal; Allan (L.); Nicholls and Stevens, equal.

HYDRAULIC MACHINERY.

FOURTH YEAR.—(*Electrical Engineering Courses*).—*Class I.*—Nelson, Allan (S.J.). *Class II.*—Corriveau; Duncan and Fraser (J.W.), equal; Miller (A.K.), Cornwall. *Class III.*—St George, Glassco (J.G.), Montgomery.

HYDRAULIC MACHINERY AND HYDRAULIC LABORATORY.

FOURTH YEAR.—(*Civil and Mechanical Engineering Courses*).—*Class I.*—None. *Class II.*—Ewart, Walker; Macmaster and Neville, equal; Osborne, Hamilton; Byers and Sise, equal. *Class III.*—Burgoyne, Smith (G.B.), Arkley.

HYGIENE.

THIRD YEAR.—*Class I.*—Northwood. *Class II.*—Hutchings (G. H.). *Class III.*—Hutchings (S. C.).

KINEMATICS OF MACHINES.

SECOND YEAR.—*Class I.*—None. *Class II.*—Scott (H. E.), Smith (G. M.), Hicks, Sterns, MacKeen, Smith (J. M.) and Jackson, equal; Dunfield, Murphy, Addie. *Class III.*—Mackay (E.), Newton; Baird and Edgar, equal; Peck, Mathers, Pearson.

LABORATORIES.

FOURTH YEAR.—(*Assay Laboratory*).—*Class I.*—Corriveau and Gillean and Leman and Robertson (P. W. K.), equal. *Class II.*—Maclennan and Moore, equal; Barber; Cary and Cowans, equal. *Class III.*—Buchanan; Donaldson and Nicholls, equal.

FOURTH YEAR.—(*Chemical Laboratory*). (*Mining Engineering Course*).—*Class I.*—Gillean, Howard (L. O.), Andrewes, Leman, Robertson. *Class II.*—Corriveau, Maclennan, Moore, Cary. *Class III.*—Cowans, Stevens, Maclaren (G. M.), Buchanan, Donaldson, Nicholls. (*Chemistry Course .*—*Class I.*—None. *Class II.*—Barber.

THIRD YEAR.—(*Chemical Laboratory*). (*Mining Engineering Course*).—*Class I.*—Fraser (D. C.), Reynolds, Ritchie, McKenzie, Archer. *Class II.*—Galbraith; Edwards and Frechette, equal; Flint, White, Tupper, Palmer, Burchell Ogilvie (*Chemistry Course*).—*Class I.*—DeBlois, Paterson.

SECOND YEAR.—(*Civil Engineering Course, Special*).—*Class I.*—Heaman. (*Electrical and Mechanical Engineering Courses, opt.*)—*Class I.*—Jackson. *Class II.*—Sterns, *Hartz. *Mining Engineeering Course.*—*Class I.*—Corless, Robertson (J. F.); Barwick and DePencier, equal. *Class II.*—Campbell and Meyers, equal; Coulson, McBride, Maclaren (F. H.), Porcheron; Brainerd and Johnston, equal; Crawford, Lockerby. (*Chemistry Course*).—*Class I.*—None. *Class II.*—Cape.

FOURTH YEAR.—(*Electrical Laboratory*).—*Class I.*—Duncan and Glassco (J. G.), equal; Allen (S. J.) and Nelson, equal; Shepherd; Fraser (J. W.) and Montgomery, equal; Miller (A. K.) and St. George, equal. *Class II.*—Cornwall.

THIRD YEAR.—(*Electrical Laboratory*).—*Class I.*—Burson and McLaren (J. H.), equal; Taylor. *Class II.*—Howard (R. F.), Forman (A. S.), Lloyd, Coussirat. *Class III.*—Scott (H. M.); Ward and Boyd, equal; Glassco (A. P. S.) and Higman, equal; Wakeling and Brecken, equal.

FOURTH YEAR.—(*Geodetic Laboratory*).—*Class I.*—Ewart. *Class II.*—Burgoyne and Byers, equal.

FIRST YEAR.—(*Mathematical Laboratory.*)—*Class I.*—Roberts, Gillies; Cole and Hall, equal; McCaskill and Rowlands, equal; Gale and Graham and Jones and Keith and McKay (F. A.) and Peaslee and Trimingham, equal; Anderson and Boright and Foreman (A. E.) and Hayes and Kendall and Stovel, equal. *Class II.*—Blatch and McDonald and Musgrave (R.) and Ross and Rodger and Tilt, equal; Richards; Baker and Brown and Cohen and Cooper and Langley and Oakes, equal; Musgrave (W. N.) and Thorpe, equal; Cameron and Cushing and Landry and Yuile, equal; Denne and Lambart and Morse and Robillard, equal; Barclay and Gault and James, equal. *Class III.*—MacLeod.

FOURTH YEAR.—(*Mechanical Engineering Laboratory*).—*Class I.*—Hamilton, Walker. *Class II.*—Neville, Sise, Arkley, Macmaster, Osborne, Smith (G. B.)

FOURTH YEAR.—(*Mining and Metallurgical Laboratory*).—*Class I.*—Gillean and Leman, equal; Andrewes; Corriveau and Robertson (P. W. K.), equal. *Class II.*—Moore and Maclennan, equal; Allan (L.) and Cowans, equal; Buchanan. *Class III.*—Cary, Stevens, Nicholls.

THIRD YEAR.—(*Physical Laboratory*). (*Civil, Mechanical, Mining Engineering and Chemistry Courses*).—*Class I.*—Labatt, Schwitzer, Burchell; Flint and Gagnon, and Paterson, equal; Pyke. *Class II.*—Burwell and Edwards and Fraser (D. C.), equal; Millar (J. L.); Cameron and McKenzie and Palmer, equal; Clement and Lowden and Ritchie, equal; Frechette and Ogilvie and Wilson, equal; Blanchard and Reynolds and Tupper and White, equal; Hampson. *Class III.*—Galbraith; Archer and DeBlois, equal; Blue, Jamieson. (*Electrical Engineering Course*). —*Class I.*—Burson, McLaren (J. H.). *Class II.*—Coussirat, Scott (H. M.). *Class III.*—Forman (A. S.) and Taylor, equal; Lloyd, Ward, Boyd, Glassco (A. P. S.), Higman.

*To pass Supplemental in paper.

SECOND YEAR.—(*Physical Laboratory*).—*Class I.*—Corless; Smith (G. M.) and Smith (J. M.), equal; MacKeen and Murphy and Newton, equal; Addie and Bigger and Heaman and Sterns, equal; Baird and Beck and Coulson and Dunfield, equal; Barwick and Campbell and DePencier and Edgar and Hicks and Pearson, equal. *Class II.*—Dupuis; Jackson and Robertson (J. F.), equal; Cape and Crawford and Pratt, equal; Mackay E.) and Maclaren (F. H.) and Meyers, equal; Borden and McBride, equal; Johnston; Brainerd and Mathers, equal. *Class III.*—Ralph; Lawrence and Sewell, equal; Peck.

FIRST YEAR.—*Physical Laboratory.*—*Class I.*—Boright, Brown; Hall and Macfarlane and McKay (F. A.), equal; Foreman (A. E.) and Hayes and McCaskill and McDonald, equal; Fraser and Jones and Keith, equal; Porter; Cole and McKergow and Richards and Roberts, equal; Gale and Gillies, equal; Gault and Graham, equal; Musgrave (R.) and Rowlands, equal; Baker and Peaslee and Ross and Stovel and Thorpe and Tilt, equal. *Class II.*—Robillard and Rodger, equal; Anderson and Cooper and Kerr and Langley and Morse and Warrington, equal; Cameron and Landry and Cohen and James and Meldrum, equal; Blatch and Musgrave (W. N.) and Oakes, equal; Kendall and Lambart and Savage and Whiteway and Yuile, equal; Denne. *Class III.*—Lockerby and Trimingham, equal; Eaton; MacLeod and Smith (R. E.), equal; Barclay and Pemberton equal; Vallières de St. Réal, Sims, Morgan.

FOURTH YEAR.—(*Testing Laboratory*).—*Class I.*—Ewart; Burgoyne and Byers, equal.

THIRD YEAR.—(*Testing Laboratory*).—*Class I.*—McLaren (J. H.), Archer, Burson; Blanchard and Cameron and Clement and Ward, equal. *Class II.*—Frechette and Wilson, equal; Schwitzer and Taylor and Tupper, equal; Gagnon; Allan (L.) and Boyd and Glassco (A. P. S.) and Wilson, equal. *Class III.*—Coussirat and Fraser (D. C.) and Lowden and Ogilvie and Scott (H.M.), equal; Edwards and McKenzie and Reynolds, equal; Blue and Flint and Hampson and Lloyd and Ritchie, equal; Howard (R. F.) and Palmer, equal; Burwell and Higman, equal; Green.

LETTERING.

FIRST YEAR.—*Class I.*—Jones; Brown and Cole and McKay (F. A.), equal; Peaslee; Foreman (A. E.) and Graham, equal; Cooper and Hall and Roberts and Thorpe, equal; McCaskill; Blatch and James and Keith and McKergow and Musgrave (R.) and Robillard, equal: Denne and Hayes, equal; Gale and Lambart and Langley and Tilt, equal; Musgrave (W. N.) and Warrington, equal; Kendall and Rodger and Trimingham, equal; Baker. *Class II.*—Anderson and Gillies and Kerr and McDonald, equal; Barclay, Ross, Boright and Gault and Richards, equal; Stovel and Yuile, equal; Cameron and Rowlands, equal; Fraser (T. C.), Morse, Cohen; Macfarlane and Savage, equal; Oakes and Sims and Vallières de St. Réal, equal; Landry. *Class III.*—MacLeod, Pemberton, Eaton.

MACHINE DESIGN.

FOURTH YEAR.—(*Electrical Engineering Course*). *Class I.*—Allen (S. J.) and Nelson, equal. *Class II.*—Miller (A. K.); Glassco (J. G.) and Shepherd, equal; Duncan; Cornwall and St. George, equal. *Class III.*—Montgomery, Fraser (J. W). (*Mechanical Engineering Course*). *Class I.*—None. *Class II.*—Walker. *Class III.*—Macmaster and Neville, equal; Hamilton and Osborne, equal; Arkley, Smith (G. B.).

THIRD YEAR.—*Class I.*—McLaren (J. H.); Boyd and Glassco (A. P. S.) and Wilson, equal. *Class II.*—Archer, Burson, Ritchie, Pyke, Burwell, Taylor, Schwitzer. *Class III.*—Ward (P. W.), Ogilvie, Forman (A. S.), Lloyd; Millar (J. L.) and Tupper, equal; Frechette, Coussirat; Scott (H. M.) and White, equal; Howard (R. F.), Edwards.

MAPPING.

THIRD YEAR.—(*Civil Engineering Course*). *Class I.*—None. *Class II.*—Blanchard and Gagnon, equal; Clement. (*Mining Engineering Course*). *Class I.* Archer and McKenzie, equal; Frechette and Galbraith, equal. *Class II*—Fraser (D. C.), White, Edwards; Palmer and Tupper, equal; Ritchie, Ogilvie. *Class III.*—Blue, Flint; Burchell and Reynolds, equal.

SECOND YEAR.—(*Mining Engineering Course*). *Class I.*—Heaman, Borden. *Class II.*—Bigger, Beck. (*Mining Engineering Course*). *Class I.*—Campbell, Robertson (J. F.) *Class II.*—Barwick, De Pencier, Porcheron; Corless and Coulson, equal; Meyers. *Class III.*—Crawford, Brainerd, McBride, Maclaren (F. H.)

MATHEMATICS

THIRD YEAR.—*Calculus, etc. Class I.*—McLaren (J. H.); Archer and Clement, equal; Burson, Palmer. *Class II.*—Fraser (D. C.), Ward; Edwards and Ogilvie and Pyke, equal; Schwitzer, Glassco (A. P. S.), Coussirat. *Class III.*—Lowden and Scott (H. M.), equal; Howard (R. F.), Taylor; Cameron and Hampson and McKenzie, equal; Blanchard and Blue and Boyd and Burwell and Galbraith and Reynolds and Ritchie and White and Wilson, equal.

Mechanics.—*Class I.*—Burson, Glassco (A. P. S.), Archer; Edwards and Fraser (D. C.) and McLaren (J. H.) and Taylor, equal. *Class II.*—Clement and Foreman (A. S.), equal; Cameron and Hampson and Howard (R.F.), and Ritchie and Schwitzer, equal; Scott (H. M.), Blue and Ward, equal; Higman and Wilson, equal. *Class III.*—Ogilvie and Palmer, equal; Boyd; Blanchard and Galbraith and Lowden, equal; Coussirat and Frechette and Miller (J. L.), equal; Tupper; Gagnon and McKenzie, equal; Pyke.

SECOND YEAR.—*Analytical Geometry.—Class I.*—Corless, De Pencier, Sterns; Addie and Robertson (J. F.) and Scott (H. E.), equal; Bigger and Smith, (G.), equal. *Class II.*—Barwick, Jackson, Heaman, Hicks, Mackay (E.), Ralph, Meyers. *Class III.*—MacKeen and Murphy, equal; Baird and

Smith (J. M.), equal ; Dunfield, Borden, Newton, Maclaren (F. H.), Coulson.

Calculus.—Class I.—Corless, Scott (H.E.), Robertson (J.F.), Sterns. *Class II.*— Bigger, DePencier, Murphy ; Addie and Smith (J.M.), equal; Hicks. *Class III.*—Smith, (G.) Newton, McBride, Baird, Meyers, Heaman ; Dunfield and MacKeen, equal ; Brainerd ; Cape and Jackson and Mackay (E.), equal ; Borden.

Mechanics.—Class I.—Corless and DePencier, equal ; Robertson (J.F.) Sterns. *Class II.*—Scott (H. E.), Smith (G. M.), Smith (J. M), Hicks, Heaman, MacKeen, Barwick. *Class III.*—Bigger ; Jackson and Murphy, equal ; Mathers, Newton, Meyers ; Dunfield and McBride, equal ; Addie and Borden and Mackay (E.) equal.

First Year.—(*Algebra*).—*Class I.*—Foreman (A.E.), Cooper ; Hall and Roberts, equal ; Brown, McCaskill, Rowlands ; Jones and McKay (F.A.), equal ; Tilt. *Class II.*—Peaslee and Ross, equal ; Boright ; Hayes and Trimingham, equal ; McDonald and Richards, equal ; Rodger ; Graham and Stovel, equal ; Barclay and Gale, equal ; Anderson, Fraser (T. C.), Cohen ; Keith and Musgrave (W.N.), equal ; Baker, Gillies. *Class III.*—Pemberton ; Blatch and Kendall and Thorpe, equal ; Oakes ; Landry and Musgrave (R.), equal ; Langley, Lambart ; James and Yuile, equal.

Dynamics.—Class I.—Hall, Boright, Roberts ; Foreman (A.E.), and Jones equal ; Cooper and McKay (F.A.), equal ; Keith ; Peaslee and Stovel, equal ; Pemberton. *Class II.*—Blatch and Rodger and Tilt, equal ; Richards ; Brown and Gillies, equal ; McCaskill ; Anderson and Gale and Morse, equal ; Trimingham ; Graham and Kendall and McDonald, equal. *Class III.*—Baker and McKergow and Thorpe, equal ; Musgrave (R.) ; Cole and Hayes, equal ; Langley ; Cohen and James, equal ; Cameron ; Kerr and Lambart and Porter, equal ; Macfarlane ; Musgrave (W.N.) and Smith (R.E.), equal ; Barclay and Landry and Ross and Rowlands, equal.

Geometry.—Class I.—Foreman (A. E.), Richards, Peaslee, Brown, Hall ; Rodger and Rowlands, equal ; McCaskill, Roberts, Cooper. *Class II.*—Anderson, Boright, Jones, Landry ; Fraser (T.C.) and Hayes, equal ; Gale, Oakes ; Baker and Graham and Morse, equal ; Stovel, Gillies, Warrington, Cohen ; McKay (F. A.) and Tilt, equal ; Langley ; Keith and Kendall, equal. *Class III.*—Blatch and Ross, Musgrave (R.), Yuile, James ; Kerr and McDonald and Trimingham, equal ; Cameron and Thorpe, equal ; Smith (R.E.) ; *Cole and Lambart, equal ; Musgrave (W. N.), McKergow, *Porter, *Savage, *Robillard.

Trigonometry.—Class I.—Cooper and Foreman (A. E.), equal ; Brown Hall, McDonald, Peaslee, Roberts. *Class II.*—Pemberton and Rodger and Rowlands and Stovel, equal ; Boright and Jones and Oakes, equal ; Hayes and Tilt, equal ; McKay (F. A.) and Thorpe, equal ; Richards, James, Musgrave (W.N.), Gale ; McCaskill and McKergow, equal ; Gillies, Musgrave (R.) ; Baker and Fraser (T. C.), equal ; Morse ; Lambert and Trimingham,

*Supplemental in Plane Geometry.

equal; Kendall, Langley, Cohen. *Class III.*—Cole and Graham and Keith, equal; Barclay and Blatch and Landry and Ross, equal; Macfarlane; Anderson and Yuile, equal; Sims, Whiteway.

MECHANICAL DRAWING.

THIRD YEAR.—(*Electrical Engineering Course.*)—*Class I.*—Ward. *Class II.*—Scott (H. E.), Burson, McLaren (J. H.), Coussirat, Higman, Taylor. *Class III.*—Lloyd, Brecken; Boyd and Forman (A. S.), equal; Glassco (A. P. S.) and Scott (H. M.), equal. (*Mechanical Engineering Course.*)—*Class I.*—None. *Class II.*—Lowden, Cameron, Wilson, Burwell. *Class III.*—Schwitzer, Hampson. (*Mining Engineering Course.*)—*Class I.*—None. *Class II.*—Archer; McKenzie and Porcheron, equal; Galbraith, Fraser (D. C.), Edwards. *Class III.*—Palmer, Allan (L.); Frechette and Tupper, equal; Ritchie.

SECOND YEAR.—*Class I.*—Campbell and De Pencier, equal; Robertson (J. F.); Barwick and Corless, equal. *Class II.*—Newton, Sterns, MacKeen, Addie, Smith (J. M.), Smith (G.), Murphy, Hicks, Baird, Edgar. *Class III.*—Brainerd and Dunfield and Mathers, equal; Jackson, Coulson, Meyers, McBride, Meldrum, Hartz, Crawford.

METALLURGY.

THIRD YEAR.—*Class I.*—DeBlois and Paterson, equal; Frechette, Edwards, Archer, Labatt. *Class II.*—Reynolds; McKenzie and Ogilvie, equal; Ritchie, Burchell; Flint and Palmer, equal; Fraser (D. C.), Tupper. *Class III.*—Galbraith, Blue, White (G. V.).

METALLURGY (ADVANCED).

FOURTH YEAR.—*Class I.*—Cowans, Gillean; Robertson (P. W. K.), and Andrewes, equal; Corriveau. *Class II.*—Moore, Maclennan, Allan (L.), Nichols, Buchanan, Cary. *Class III.*—Donaldson, Leman, Stevens.

METALLURGY (IRON, STEEL, ALLOYS, ETC.)

FOURTH YEAR.—*Class I.*—Gillean, Robertson (P. W. K.), Moore. *Class II.*—Andrewes, Maclennan, Corriveau, Cary, Cowans, Stevens, Allan (L.), Walker, Buchanan. *Class III.*—Arkley and Neville, equal; Hamilton and Nicholls, equal; Donaldson, Macmaster; Osborne and Sise and Smith, equal.

METALLURGY (GOLD AND SILVER.)

FOURTH YEAR.—*Class I.*—Gillean and Robertson (P. W. K.), equal; *Class II.*—Leman; Cowans and Maclennan and Moore, equal; Allan (L.) and Andrewes, equal; Corriveau. *Class III.*—Stevens, Donaldson, Buchanan, Cary, Nicholls.

MINERALOGY ADVANCED.

FOURTH YEAR.—*Class I.*—Gillean. *Class II.*—Corriveau, Leman, Andrewes, Barber, Maclennan, Nicholls, Robertson (P. W. K.). *Class III.*—Cary, Howard (L. O.), Moore, Buchanan, Cowans.

THIRD YEAR.—*Class I.*—Paterson, DeBlois. *Class II.*—Edwards, Archer. *Class III.*—Ogilvie, Reynolds, Frechette, Labatt; McKenzie and Palmer and Tupper, equal; Flint, Fraser(D. C.), Ritchie, Galbraith.

MINERALOGY (DETERMINATIVE).

THIRD YEAR.—*Class I.*—Paterson, Ritchie, DeBlois, Archer, Maclennan. *Class II.*—Edwards, Fraser (D. C.), Frechette. *Class III.*—Galbraith, Flint, Burchell, McKenzie, Reynolds; Ogilvie and Palmer, equal; *Labatt, *Tupper.

*To pass Supplemental in practical work.

MINING.

FOURTH YEAR.—*Class I.*—Robertson (P. W. K.) *Class II.*—Gillean and Moore, equal; Andrewes, Corriveau, Leman, Maclennan; Allan (L.), and Cowans, equal; Cary, Nicholls. *Class III.*—Donaldson, Buchanan, Stevens.

MINING MACHINERY (OPTIONAL).

FOURTH YEAR.—*Class I.*—Moore; Corriveau and Gillean and Robertson (P. W. K.), equal. *Class II.*—Allan (L.) and Leman and Nicholls, equal; Cary, Stevens. *Class III.*—Cowans.

MODELLING.

FOURTH YEAR.—*Class I.*—Staveley.
THIRD YEAR.—*Class I.*—Northwood.

MUNICIPAL ENGINEERING (ROADS, ETC.).

THIRD YEAR.—*Class I.*—Clement. *Class II.*—Blanchard. *Class III.*—Green, Gagnon.

MUNICIPAL ENGINEERING (SANITARY).

THIRD AND FOURTH YEARS.—*Class I.*—Ewart, Blanchard. *Class II.*—Burgoyne, Clement and Byers, equal; Gagnon.

ORE DRESSING.

FOURTH YEAR.—*Class I.*—Andrewes, Moore, Maclennan; Corriveau and Robertson (P. W. K.), equal. *Class II.*—Leman, Gillean; Allan (L.) and Nicholls, equal; Cowans. *Class III.*—Donaldson, Buchanan, Stevens, Cary.

THIRD YEAR—*Class I.*—Edwards; Archer and Frechette, equal; Ritchie, *Class II.*—Reynolds, McKenzie, Flint, Galbraith, Palmer, Fraser (D. C.); White (G. V.). *Class III.*—Ogilvie, Burchell, Tupper.

PALÆONTOLOGY (OPTIONAL).

FOURTH YEAR.—*Class I.*—None. *Class II.*—Andrewes and Maclennan, equal.

PETROGRAPHY.

FOURTH YEAR.—*Class I.*—Maclennan and Gillean, equal. *Class II.*—Leman, Corriveau; Andrewes and Stevens, equal; Robertson (P. W. K.), Cowans, Nicholls; Moore and Donaldson, equal; Cary. *Class III.*—Buchanan.

PHYSICS.

THIRD YEAR.—*Class I.*—Burson, Clement, McLaren (J. H.), Edwards; Archer and De Blois, equal. *Class II.*—Coussirat, Paterson; Lloyd and Taylor, equal; Higman. *Class III.*—Reynolds and Schwitzer, equal; Cameron and Hampson, equal; Howard (R. F.) and Scott (G. W.), and Wilson, equal; Ogilvie and Ward, equal; Scott, (H. M.), McKenzie, Galbraith; Boyd and Frechette and Glassco (A. P. S.), equal; Labatt, Burwell, Flint, Forman (A. S.), Fraser (D. C.); Ritchie and Tupper, equal.

SECOND YEAR.—*Class I.*—Corless and Robertson (J. F.) and Sterns, equal; De Pencier, Smith (G. M.), Heaman, MacKeen. *Class II.*—Borden, Dunfield and Jackson, equal; Barwick, Meyers. *Class III.*—Bigger, Hicks, Murphy, Smith (J. M.); Cape and Johnston, equal; Mackay (E.), Pearson; Baird and Coulson, equal; Edgar, Addie; Mathers and McBride, equal; Campbell, Crawford.

FIRST YEAR.—*Class I.*—Foreman (A. E.), Boright, Hall, Richards, Peaslee Brown, Roberts, McCaskill, Pemberton, McKay (F. A.); Gillies and Rodger and Rowlands, equal. *Class II.*—Trimingham; Blatch and Ross, equal; Keith, Jones and McKergow, equal; Tilt, Morse, Thorpe. *Class III.*—Cole and Gale, equal; Hayes, McDonald, Cooper, Cohen, Graham, Musgrave (R.), Langley and Macfarlane and Stovel equal; Fraser (T. C.), Kendall, Denne; Baker and Cameron, equal; Yuile, James, Landry, Musgrave (W. N.), Oakes, Lambart, Anderson.

RAILWAY ENGINEERING.

FOURTH YEAR.—*Civil and Mining Engineering Courses.*—*Class I.*—Ewart. *Class II.*—Gillean; Corriveau and Maclennan, equal; Andrewes, Moore, Robertson (P. W. K.), Leman, Cary, Burgoyne; Byers and Donaldson, equal. *Class III.*—Nicholls, Buchanan, Cowans.

SHOPWORK.

FOURTH YEAR.—*Class I.*—Walker, Smith (G. B.), Hamilton. *Class II.*—Arkley and Neville, equal; Osborne, Macmaster. *Class III.*—Percy and Sise.

THIRD YEAR.—*Class I.*—Burwell, Burson, Wilson, McLaren (J. H.); Forman (A. S) and Taylor, equal. *Class II.*—Howard (R. F.) and Lowden and Ward, equal; Millar (J. L.) and Schwitzer, equal; Brecken, Higman; Cameron and Scott (G. W.), equal; Hampson; Lloyd and Scott (H. M.), equal. *Class III.*—Pyke; Boyd and Coussirat, equal; Glassco (A. P. S.), Wakeling.

SECOND YEAR.—(*Architectural, Civil and Mining Engineering Courses*).—*Class I.*—Johnston, Corless, Brainerd, Robertson (J. F.), De Pencier; Barwick and Beck and Campbell and Pratt, equal. *Class II.*—Maclaren (F. H.) and McBride, equal; Borden, Crawford; Bigger and Meyers, equal. *Class III.*—Coulson, Lockerby, Heaman, Ralph. (*Electrical and Mechanical Engineering Courses*).—*Class I.*—Murphy and Smith (J. M.), equal; Hicks, Sterns. *Class II.*—Addie; Baird and Smith (G. M.), equal; Dunfield and Newton, equal; Jackson, Hartz; Porter and Whitley, equal; Mac-

Keen ; Pearson and Whiteway, equal ; Mathers and Ward, equal. *Class III.*—Dupuis and Edgar and Smith (R. E.), equal ; Lawrence and Peck, equal ; Mackay (E.), Weagant.

FIRST YEAR.—*Class I.*—Gillies, Boright, Brown. *Class II.*—Graham and McKay (F. A.), equal ; Anderson and Foreman A. E.) and Fraser (T. C.) and Jones and McCaskill and Roberts, equal ; Cole and Hayes and McKergow and Musgrave (R.), equal ; Gale and Pemberton, equal ; Kendall and Macfarlane and McDonald and Stovel and Thorpe, equal ; Baker and Cooper and Denne and Fraser (R. L.) and Hall and Keith and Landry and Riley, equal ; Blatch and James and Morse and Oakes and Rodger and Rowlands and Tilt, equal ; Gault and Peaslee and Richards and Robillard, equal ; Lambart and Ross, equal ; Warrington. *Class III.*—Cameron and Cohen and Musgrave (W. N.), and Vallières de St. Réal, equal ; Eaton and Langley and Sims and Savage, equal ; Harris, Barclay, Cape.

SUMMER ESSAYS.

FOURTH YEAR.—(*Civil Engineering Course*).—*Class I.*—Byers and Ewart, equal. *Class II.*—None. *Class III.*—Burgoyne. (*Electrical Engineering Course*) Allen (S. J.) and Glassco (J. G.) and Nelson, equal ; Duncan. *Class II.*—Cornwall and St. George and Miller (A. K.) and Montgomery, equal ; Fraser (J. W.). (*Mechanical Engineering Course*).—*Class I.*—Shepherd. *Class II.*—Arkley, Hamilton, Smith (G. B.). *Class III.*—Osborne, Macmaster, Walker, Sise, Neville. (*Mining Engineering Course.—Class I.*—Corriveau, Robertson (P. W. K.), Gillean. *Class II.*—Buchanan and Cowans, equal ; Andrewes, Moore. *Class III.*—Cary. (*Chemistry Course*). *Class I.*—Barber.

THIRD YEAR.—*Civil Engineering Course.—Class I.*—None. *Class II.*—Blanchard Gagnon, Clement. *Electrical Engineering Course.—Class I.*—None. *Class II.*—Foreman (A. S.), Burson, Howard (R. F.), Brecken and Lloyd and Wakeling, equal. *Class III.*—Taylor ; Coussirat and Higman and McLaren (J. H.), equal ; Boyd. (*Mechanical Engineering Course*). *Class I.*—Wilson, Galbraith, Pyke. *Class III.*—Cameron and Lowden, equal ; Flint. (*Mining Engineering Course*). *Class I.*—Edwards, Ritchie. *Class II.*—Palmer, Burchell, Fraser (D. C.), Frechette, Ogilvie ; Blue and McKenzie and Tupper, equal. *Class III.*—Reynolds, White (G. V.). (*Chemistry Course*).—*Class I.*—None. *Class II.*—Jamieson and Labatt, equal. *Class III.*—DeBlois.

SUMMER READING (ENGLISH).

SECOND YEAR.—*Class I.*—Sterns, Corless, DePencier ; McBride and Heaman, equal. *Class II.*—Dunfield, Barwick, Brainerd ; Robertson (J. F.) and Mathers, equal ; Edgar and Smith (G.), equal ; Cape, Jackson. *Class III.* Mackay, Addie, Bigger, Pearson ; Hicks and Coulson, equal ; Ralph and Weagant, equal ; Murphy, Smith (J. M.), Meyers, Pratt, Maclaren (F. H.), Campbell, Peck ; Sewell and Beck and Newton, equal ; Lawrence and Baird and Crawford, equal.

SURVEYING.

THIRD YEAR.—(*Civil and Mining Engineering Courses*).—*Class I.*—Clement, Archer. *Class II.*—Edwards, Frechette, Tupper, Blanchard. *Class III.*—Ogilvie, Maclennan, Fraser (D. C.), Galbraith; McKenzie and Leman, equal; Flint, Palmer.

SECOND YEAR.—(*Civil and Mining Engineering Courses*).—*Class I.*—Corless, Robertson (J. F.), Borden, De Pencier. *Class II.*—Bigger, Barwick, Heaman, Coulson. *Class III.*—McBride, Maclaren (F. H.), Campbell.

SURVEYING FIELD WORK.

SECOND YEAR.—(*Civil and Mining Engineering Courses*).—*Class I.*—Barwick and Borden and Corless and De Pencier and Robertson (J. F.), equal; Bigger. *Class II.*—Maclaren (F. H.), Heaman, Meyers, Coulson; Beck and Campbell and Johnston and McBride, equal. *Class III.*—Brainerd and Crawford and Porcheron, equal; Ralph.

THEORY OF STRUCTURES.

FOURTH YEAR.—*Class I.*—None. *Class II.*—Burgoyne, Byers, Ewart.

THIRD YEAR—*Class I.*—McLaren (J. H.), Burson, Clement; Edwards and Gagnon, equal. *Class II.*—Fraser (D. C.) and Glassco (A. P. S.), equal; Cameron, Schwitzer; Ogilvie and Taylor, equal; Boyd and Scott (H. M.), equal; Hampson and Howard (R. F.), equal; Allan (L.), and Ward (P. W.) and White (G. V.), equal; Palmer and Wilson, equal; Burwell and Reynolds and Ritchie, equal. *Class III.*—Archer, Blanchard, Forman (A. S.); Frechette and Pyke and Tupper, equal; Blue; Galbraith and Lowden, equal.

THERMODYNAMICS.

FOURTH YEAR.—(*Civil and Mining Engineering Courses.*)—*Class I.*—Corriveau, Allan (L.). *Class II.*—Robertson (P. W. K.), Gillean, Ewart, Byers, Moore. *Class III.*—Nicholls, Cary, Donaldson, Burgoyne, Buchanan. (*Electrical Engineering Course*).—*Class I.*—Allen (S. J.) and Nelson, equal; Shepherd. *Class II.*—Duncan, Miller (A. K.), St. George, Glassco (J. G.). *Class III.*—Cornwall; Fraser (J. W.) and Montgomery, equal. (*Mechanical Engineering Course*).—*Class I.*—None. *Class II.*—Walker, Hamilton, Neville. *Class III.*—Arkley; Macmaster and Osborne, equal; Smith (G. B.).

THIRD YEAR.—*Class I.*—Clement. *Class II.*—Burson and McLaren (J. H.) and Taylor, equal; Tupper; Coussirat and Pyke and Schwitzer and Scott (H. M.) and Wilson, equal; Archer and Gagnon and McKenzie, equal; Glassco (A. P. S.) and Howard (R. F.), equal. *Class III.*—Boyd; Burwell and Cameron and Lloyd and Palmer, equal; Fraser (D. C.); Blanchard and Hampson and Ward, equal; Burchell and Ogilvie and Ritchie, equal; Edwards and Frechette and Millar (J. L.), equal.

Students of the University

SESSION 1899–1900.

McGILL COLLEGE.

FACULTY OF LAW.

FIRST YEAR.

Astle, Thomas Francis, Little Metis, P.Q.
Aylmer, Henry U.P., Richmond, P.Q.
Belknap, Sewell F., Knowlton, P.Q.
Bonin, Alexander L., Montreal
Brown, Ernest N., Lachine
Cotton, Charles Mackay, Sweetsburg, P.Q.
Couper, William Mason, Montreal South
Draper, Denis C., Sutton Jct., P.Q.
Duff, Alexander Huntley, Montreal
Gariépy, Wilfred, Edmondton, Alta.
Letendre, Fred., Montreal
Lussier. Edward Charles, Sorel, P.Q.
Ogden, Charles G., Three Rivers, P.Q.
Peloquin, Roméo, Montreal
Smith, H. E. Montreal
Staveley, Wm R., Montreal
Theberge, Albert, St. Jérome, P.Q.
Vipond, Herbert S., Montreal
Wainwright, Arnold, Montreal

SECOND YEAR.

Beique, Fred., Montreal
Campbell, G. A., B.A., (McGill) Montreal
Curran, Louis E., Montreal
Doak, A. E, Coaticook, P.Q.
Holden, A. R., B.A., B.Sc., (McGill), Montreal
McMaster, A. R., Montreal
McMichael, R. C., Windsor Mills, P.Q.
Mann, J. A., Montreal
Meagher, J. J., Montreal
Mitchell, W. G., Danby, P.Q.
Moffat, D. S., B.A., (McGill), Inverness, P.Q.
Normandin, Z., St. Henri, P.Q.
Place, E. G., Millington, P.Q.
Rowat, D. McK., Athelstan, P.Q.
Skinner, Waldo M., St. John, N.B.
Springle, Hobart A., Montreal
Thompson, J. R., Kinnear's Mills, P.Q.
DuTremblay, P. R., Ste. Anne de la Pérade, P.Q.
Westover, E. W., Sutton, P.Q.

THIRD YEAR.

Archibald, Samuel G., B.A., (McGill), Montreal
Baby, H., B.L., Montreal
Baker, George H., Sweetsburg, P.Q.
Ball, W. S., East Bolton, P.Q.
Barlow, J. C., Montreal
Bercovitch, P, Montreal
Burke, Edmund A., Montreal
Chauvin, Henry, Montreal
Dobell, Alfred, B.A., Quebec, P.Q.
Enright, Frederick T., Sherbrooke, P.Q.
Garneau, Léon, Ottawa
Kay, William F., Montreal
McCabe, F. E. P. F., Windsor Mills, P.Q.
Macalister, A. W. G., Danville, P.Q.
Macfarlane, L., B.A., (McGill), Montreal
Mackay, Hugh, Montreal
Margolese, Louis, Montreal
Mayrand, O., B.L, St. Phillipe, P.Q.
Redpath, Jocelyn C., Montreal
Rinfret, T., Montreal
Robertson, W. G. M., B.A., (Bishops'), Sherbrooke; P.Q.
Thomson, A. B., Montreal
Trihey, Harry, Montreal
Walsh, Thomas E., B.A., (Laval), Montreal
Whelan, Joseph, Montreal

FACULTY OF MEDICINE.

FIRST YEAR.

Allan, R. H., Montreal Que
Allum, A. W., Renfrew, Ont
Anderson, C. W., B.A., Halifax, N.S
Anderson, R. J. R., Chaudiere, Que
Andrews, J. J., St. Lambert's, Que
Auston, J. B., Brighton, Ont
Bailey, G. W., Fredericton, N.B
Billings, W. H., Hamilton, Ont
Bishop, G. A., Kinburn, Ont
Boyd, O., Russell, Ont
Bromley, J. E., Pembroke, Ont
Brooks, J. E., B.A., Eastport, Maine, U.S.A
Brown, I. E., Edwards, N.Y., U.S.A
Bulmer, A. M., Montreal, Que
Burns, A. S., B.A., Kingston Station, U.S
Campbell, W. G., Brantford, Ont
Cary, W. H., Montreal, Que
Chamberlain, H. B., Perth, Ont
Chaplin, H. L. S., St. John's, Nfld
Church, H. C., Chelsea, Que
Conway, C. J., Melville, Mass., U.S.A
Cowperthwaite, H. H., St. Johns, Nfld
Crosby, P. C., Marshfield, P.E.I
*Crowell, B. C., Yarmouth, N.S
Cumming, W. G., B.A., Montreal, Que
Dickson, A. J., B.A., Goderich, Ont
Donnelly, William H., Montreal, Que
Donohoe, J. J, B.A., Worcester, Mass, U.S.A
Doyle, F. H., B.A., Natick, Mass., U.S.A
Eaton, F. C., Hancock, N.H., U.S.A
Ebbett, L. P. B., Lower Gagetown, N.B
*Elder, R., Trout River, Que
Ells, R. H., Ottawa, Ont
English, J. M., New Westminster, B.C
Forbes, R. D., Stratford, Ont
Freeze, E. H., Penobsquis, N.B
*Fripp, G. D., Ottawa, Ont
Frost, A. C., Montreal, Que
Gale, W. P., Quebec, Que
Gillis, J. H., Campbellton, N.B
Gould, D., York Harbor, Maine, U.S.A
Gow, R. J., Warkworth, Ont
Gulliver, F. D., Portland, Maine, U.S.A
*Hall, O., Washington, Ont
Hansen, N.C., M.A., St. John, N.B
Hardisty, R. H. M., Montreal, Que
†Hersey, R. J., Montreal, Que
†Hewitt, T. J., Montreal, Que
Hoy, C. N., Orillia, Ont
Humphrey, G. A., Montreal, Que
Husband, B. K., Hamilton, Ont
Hutchinson, J. W., Montreal, Que
Inksetter, F. S., Dundas, Ont
†Kearns, D. A., Ottawa, Ont
Kenny, R. W., Ottawa, Ont
†Kerr, H. H., Washington, D.C., U.S.A
Kissane, J. W., Chateaugay, N.Y., U.S.A
Langsford, A. W., Cameron, Ont
Laurie, E., B.A., Montreal, Que
Lamb, W. V., St. Andrews, N.B
Lundie, J. A., B.A., Montreal, Que
Lyman, W. S., Knoxville, Tenn., U.S.A
Lynch, A. L., Ottawa, Ont
MacCallum, J. D. G., Montreal, Que
Macdonald, R. St. J., B.A., Bailey's Brook, N.S
Mackenzie, W. A., Wood Islands N., P.E.I
MacMillan, T. F., Montreal, Que
†Macnab, C. R., Salmon, Idaho, U.S.A
MacNeill, A. L. H., Stanley Bridge, P.E.I
McCulloch, J. M., Durham, Ont
McDiarmid, C. A., Kemptville, Ont
McDonald, S., St. John, N.B
McEachern, I. W. T., Rockland, Ont
McGeachy, J. A. M., Iona, Ont
McGillis, J. D., Montreal, Que
McGrath, F. C., Norway, P.E.I
McGuigon, J. D., Kelly's Cross, P.E.I
McInerney, D. C., Kingston, N.B
McIntosh, H. H., Montreal, Que
McIntosh, J. A., Yankleek Hill, Ont
McKechnie, D. W., Dundas, Ont
McLaren, D. D., Felton, Ont
McLaughlin, E. M., Winona, Minn., U.S.A
McNeil, W. C., Peterboro, Ont
Maby, W. J., Cohoes, N.Y., U.S.A
Magee, C. F., North Gore, Ont
Maillet, H. A., Bute City, Montana, U.S.A
Manion, W. T, Waterford, N.Y., U.S.A
Markson, S., Glen Robertson, Ont
Meindl, A. G., Mattawa, Ont
Montgomery, C. H., St. John, N.B
Morris, S. C., Wallace, N.S.
Munro, A. J., Montreal, Que
Munro, J. H., Maxville, Ont
Munroe, H. E., St. Elmo, Ont
*Murphy, H. H., Antrim, Ont
Murray, J. S., St. John, N.B
Nathan, D., Montreal, Que
Nelson, J. S., City View, Ont
Nelson, W. E., Montrea, Que
O'Brien, C. W., B.A., Noel, N.S
Oliver, C. J., Mansonville, Que
†Oliver, J. A., Winnipeg, Man
O'Neill, J. M., Messina, N.Y., U.S.A
Park, A. W., Durham, Ont
Parris, N. D., Barbadoes, W.I
Patch, F. S., B.A., Montreal, Que
Peterson, G. R., Toy's Hill, Ont
Price, J., Campbellton, N.B
Puddington, B. A., St. John, N.B.
Quain, B. P., Moira, N.Y., U.S.A
Rehfuss, W. N., Bridgewater, N.S
Ross, T. M., Lancaster, Ont
Rousseau, J. A., B.A., Three Rivers, Que
Saunders, T. H., Webster, Mass., U.S.A
Secord, W. H., Brantford, Ont
Seifert, F. W., Quebec City, Que
Shillington, R. N. W., Ottawa, Ont
Sibbald, J. P. M., Sutton, West Ont
Slack, M. R., Farnham, Que
Smith, C. M., Red Mountain, Que
Steeves, E. O., Upper Sackville, N.B
Sweeney, J. L., B.A., Dover, N.H., U.S.A
Taggart, E. A., Ottawa, Ont
Teitelbaum, T. A., Montreal, Que
Thomas, S. B., Bridgetown, Barbadoes, W.I
Truax, W., Farnham, Que
Turner, G. H., B.A., Baie Verte, N.B
White, P. G., Woodstock, Ont
White, S. G., Ottawa, Ont
Wilson, A., Russell, Ont
Wilson, C. E., Napanee, Ont
Wood, C. D., Montreal, Que
Winder, J. B., B.A., Compton, Que
*Wotherspoon, H., Montreal, Que

* Double Course.
† Partial.

SECOND YEAR.

Alexander, J. H., Westmount, Que
Ames, A. C., Field, B.C.
Anthony, T. B., Berwick N.S.
Anton, D. L. S., Ireland, — G.B.
Arnold, D. R., B.A. St. John, N.B.
Bailie, S. A., B.A., Troy, N.Y., U.S.A.
Belisle, J. R., Nashua, N.H., U.S.A.
Bishop, L. C., Marbleton, Que
Blair A. K., Chicoutimi, Que
Blair, H. G. F., Ashton, Ont
Blakeman, F. W., Strattord, Ont
*Boulter, J. H., Picton, Ont
Boyd, R. M., Belleville, Ont
Briggs, J. A. New Westminster, B.C
Byers, J. R., Gananoque, Ont
Campbell, J. A. E., B.A., Westmount, Q.
Cantlie, F. P. L., Montreal, Que
Carnochan. W. L. C., Montreal, Que
Carter, W. Le M., B.A., Quebec, Que
Chandler, E. C., Montreal, Que
Christie, F. J , Martintown, Ont
Codrington, R., F., Montreal, Que
Colby, J. C., B.A., Stanstead, Que
Coleman, C. E., Chatham, N.B
Cox, R. B., Collinsville, Conn., U.S.A
Cullen. W. H., Montreal, Que
Curren, L. M., Johnston, N.B
Delaney, M., Magdalen Islands
Dickson W. H., Pembroke, Ont
*Dixon, J. D., Montreal, Que
Dorion, W. A., Waterloo, Que
Douglas, F. C., Montreal, Que
Dawson. C. K., Montreal, Que
Doyle, A. J., Jacquet River, N.B
Eastman, E. B., Portsmouth, N.H., U.S.A
Evans, S., Ottawa, Ont
Fairie, J. A., Montreal, Que
Fearn, C. J., St. Johns, Nfd
Ferguson, W. H., St. Thomas, Ont
Folkins, H. G., Millstream, N.B
Ford, W. S., Belleville, Ont
Forster, J. F. C., Dorchester, N.B
Fuller, H. T., Halifax, N.S
Gardiner, R. J., Smith's Falls, Ont
Gardner, W. A., B.A., Huntingdon, Que.
Giles, G. N., Madera, Cala, U.S.A.
Gilmour, C. R., Brockville, Ont
Grant, W. W., Montreal, Que
Green. F. W., Pictou, N.S
Gurd R, D., Sarnia, Ont
Halliday, J. Le. R. Sawyerville, Que
Harris. L. C., Moncton, N.B
Hart, F. W., B.A., Sackville, N.B
Henry, C. M., Palmer, S. Dakota, U.S.A
Hollingsworth, J. E., Meekling, S. Dakota, U.S.A
Hopkins. C. W., Aroostook Junc., N.B
Horsfall, F. L., Montreal, Que
Hyatt, E. A., B.Sc., Spragueville, N.Y., U.S.A.
Irwin, F., Shelburne, N.S
Johnson, G. R., B.A., Oxford, N.S
Johnson, J. A., B.A., Lachine, Que
Jones, N. C., Gananoque, Ont
Leney, J. M., B.A., Montreal, Que
Lidstone, A. E., Richmond, West Ont
Lynch, J. B., Fredericton, N.B
Macdonald, A. A., St. Andrews, P.E.I
Mackinnon, G. E. L., Alexandria, Ont
MacLaren, A. H., B.A., Huntingdon, Que
MacNaughton, J. A., Salisbury, N.B.
McDonald, P. A., B.A., Dundee Centre, Que
*McEwen, J. R., Dewittville, Que
McGibbon, D., Arkona, Ont
McGibbon, S., Arkona, Ont
McGrath, R. H., Dorchester, N.B
McKee. W. E., Coaticooke, Que
McKenzie, J. B., B.A., Campbellton, N.B
McNeill, J. F., Kensington, P.E.I
*McPherson, Thos., Stratford, Ont
Manchester, J. W., St. John, N.B
Martin, H. E., Chatham, Ont
Mason, E. G., Westmount, Que
Mason, F. C , Plattsburg, N.Y., U.S.A.
Mason, L. D., B.A., Montreal, Que
Menzies, J. E., New Bedford, Mass
*Mitchell, I, E., Sherbrooke, Que
Moffatt, G., Inkerman, Ont
Moore, P. T., B.A., Montreal, Que
Morin, E. J., Springfield, Mass., U.S.A
Morrison, J. F., Copleston, Ont
Morse, G. R., Melvern Sqr., N.S
Morse, W. R., B.A., Lawrencetown, N.S
Mothersill, G. S , Ottawa, Ont
Ness, W., Howick, Que
Netten, P. E., Port de Grave, Nfd
O'Reilly, E. P., B.A, Hamilton, Ont
Palmer, G. H., Dorchester, N.B
Paterson, R. C., B.A., Montreal, Que
Pavey, H. L., London, Ont
Peters, O. R., Gagetown, NB.
Pickard, L. N., Charlottetown, P.E.I
Pilot, F. W. H., St. John's, Nfd
Pratt, C. M., St. John, N. B
Ramsay, W. A., Westmount, Que
*Rawlings, W. T., Montreal, Que
Ritchie, C. F., Montreal, Que
Roberts A. B., Lanark, Ont.
Robertson, J. J., Belleville, Ont
Robertson, W. G., Montreal, Que
Saunders, W. E., Woodstock, N.B
Scott, W., Montreal, Que
Shaw, D. Le B., Portland, Maine, U.S.A
Ship, M. L , B.A., Montreal, Que
Smith, T. W., Hawkesbury, Ont
Snetsinger. H, W., Moulinette, Ont
Stockwell, H. K., Danville, Que
*Strong, N. W., Cambria, Ont
Stowell, F. E., Worcester, Mass., U.S.A.
Thomas, J. W., B.A., Montreal, Que
Tolmie, J. A., Moose Creek, Ont
Townsley, R. H., Westmount, Que
Tracy E. A., B.A., Island Pond, Vermont, U.S.A.
Van Wart, R. McL., B.A., Fredericton, N.B.
*Walker, H., Jr., New York, U.S.A.
Warren, J. G., Montreal, Que
Williams, R. G., Meaford, Ont

THIRD YEAR.

Bayfield, T. F., Charlottetown, P.E.I
Beatty H. W., Sarnia, Ont
Belanger, E. R., Ottawa, Ont
Blake, J. J., Charlottetown, P.E.I
Boire, W. E., Manchester, N.H., U.S.A
Borden, H. L , B.A., Canning, N.S.

* Double Course.
† Partial.

Browne, J. G., B.A., Montreal, Que
Bruce, Jas., B.A., Moncton, N.B
Burrows, A. E., Montreal, Que
Butler, P. E., B.A., Milltown, N.B
Callbeck, A. DeB., Tryon, P.E.I
Campbell, R. P., B.A., Montreal, Que
Carlyle, D. A., Morewood, Ont
Collison, H. McN., Dixon's Corners, Ont
Collison, J., Dixon's Corners, Ont
Coristine, W. H., Montreal, Que
Crang, F. W., Toronto, Ont
Currie, W. D., Halifax, N.S
Dalton, C. H., Tignish, P.E.I
Donovan, J. B., Lewiston, Maine, U.S.A
Duncan, J. W., Montreal, Que
Egan, W. J., Sydney Mines, N.S
Ellis, R. L., Youghall, N.B
Featherston, H. C., Hamilton, Ont
Fleming, J. E., Rustico, P.E.I
Fuller, A. T., B.A., Truro, N.S
Gardner, R. L., B.A., Brockville, Ont
George, J. D., Redwood, N.Y., U.S.A
Goodall, J. R., B.A., Ottawa, Ont
Harley, R. J. O., Dublin, Ireland
Hope, J. T., Glen Robertson, Ont
Howard, A. C. P., B.A., Montreal, Que
Hughes, R. E., Rustico, P.E.I
Hunter, E. N. McL., Merrimac, Mass, U.S.A
Jackson, G. F., Brockville, Ont
Johnston, J. L., Fournier, Ont
Johnson, R. DeL., B.A., Montreal, Que
Jones, J. H., Brockville, Ont
Jones, Sydney, B.A., Cleveland, Ohio, U.S.A
Kendall, A. L., Vancouver, B.C
Ker, R. H., B.A., Montreal, Que
Lawlor, F. E., Dartmouth, N.S
Learmonth, G. E., Montreal, Que
Leggett, T. H., Ottawa, Ont
Littig, J. V., Davenport, Iowa, U.S.A
Little, H.M., B.A., London, Ont
Lomas, A. J., Montreal, Que
Lunney, T. H., St. John, N.B
MacCarthy, F. H., Ottawa, Ont
MacKay, D. S., Reserve Mines, N.S
MacKay, M., B.A., Montreal, Que
MacKenzie, S. D., Sarnia, Ont
MacNeill, J. W., Kensington, P.E.I
McDonald, C. A., Milltown, N.B
McDonald, F. E., Qu'Appelle, N.W.T
Martin, E. A., Kemptville, Ont
Martin, J. J., North Bay, Ont
May, L. W., Ottawa, Ont
Meighen, W. A., Perth, Ont
Miller, G. H. S., Alexandria, Ont
Miller, S., South Durham, Que
Moore, J. C., D.V.S., St. Chrysostome, Que
Morgan, A. D., Nanaimo, B.C
Moses, H. C., Caledonia, Ont
Mullaly, E. J., Souris, P.E.I
Newcombe, W. E., Vancouver, B.C
Niven, J. K., London, Ont
Penner E., B.A., Gretna, Man
Redon, L. H., B.A., Victoria, B.C
Richards, B.A., Yarmouth, N.S
Roberts, J., Woodburn, Ont.
Roberts, F. A., Waterloo, Maine, U.S.A
Robertson, C. G., Hawkesbury, Ont
Robertson, L. F., B.A., Stratford, Ont
Robertson, R. D., St. John, N.B
Robidoux, E. L., B.A., Shediac, N.B
Rogers, H. B., Victoria, B.C
Russel, C. K., B.A., Montreal, Que
Russell, E. M., B.A., Springfield, Mass., U.S.A
Rutherford, C. A., Waddington, N.Y
Ryan, W. T., B.A., Melville, N.B
Sanders, C. W., Kemptville, Ont
Scriver, E. F., Hamilton, Ont
Shearer, C., Montreal, Que
Shearer, R. L., Kelso P. O., Que
Simpson, E. G. W., Lennoxville, Que
Simpson, S., Bay View, P.E.I
Stentaford, G. L., Heart's Content, Nfd
Stevenson, J., B.A., Montreal, Que
Stewart, C. A., Dunvegan, Ont
Stewart, C. J., Russell, Ont
Tanner, C. A. H., Windsor Mills, Que
Taylor, D. A., Havelock, N.B
Taylor, W. L., Waterloo, Que
Ward, J. A., Lewiston, Maine, U.S.A
White, E. H., B.A., Montreal, Que
Wiggins, W. I., Lowell, Mass, U.S.A
Wiley, B. E., Fredericton, N.B
Wilkins, F. F., Montreal, Que
Williams, W., Remsen, N.Y., U.S.A
Wilson, J. J., Montreal, Que
Winter, D. E., Montreal, Que
Wyman, H. B., B.A., Chute a Blondeau, Ont

FOURTH YEAR.

Akerley, A. W. K., Fredericton, N.B
Armstrong, J. W., B.A., Bristol, Que
Baird, J. A., Brucefield, Ont
Ballantyne, C. T., Ottawa East, Ont
Beadie, W. D., Lachine Locks, Que
Bishop, T. E., Harvey Bank, N.B
Bradley, J. H., Charlottetown, P.E.I
Brannen, J. P., Montreal, Que
Brown, E. L., Chesterville, Ont
Buffett, C., B.A., Grand Bank, Nfld
Burnett, P., Montreal, Que
Carnwath, J. E. M., Riverside, N.B
Cartwright, C., Kingston, Ont
Charlton, G. A., St George, Ont
Chisholm, A. J., New Glasgow, N.S
Clemeshea, W. F., Port Hope, Ont
Coates, H. W., Bass River, N.B
Coffin, J. D., Charlottetown, P.E.I
Conroy, R. J., Peterboro, Ont
Cook, C. R., Montreal, Que
Costello, A. E., Montreal, Que
Cowperthwaite, W. M., St John's, Nfld
Cox, J. R., Hull, Que
Crozier, J.A., B.A., Ashburn, Ont
Cuzner, G., Ottawa, Ont
Donaldson, A. S., Brockville, Ont
Donnelly, A. J., B.A., Sturgeon, P.E.I
Doull, A. E., Dutch Village, Halifax, N.S
Duffy, P. F., Charlottetown, P.E.I
Eagar, W. H., Dartmouth, N.S
Freeman, C. H., B.A., Milton, N.S
Fourney, F. W., Montreal, Que
Gibson, E. J., Campbellford, Ont
Gilday, A. L. C., B.A., Montreal, Que
Gray, H. R. D., B.A., Montreal, Que
Hall, A. R., Washington, Ont
Harvie, S. K., B.A., Newport, N.S
Haszard, C. F. L., Charlottetown, P.E.I
Henry, C. K. P., Ottawa, Ont
Hiebert, G., Gretna, Man
Hill, W. H. P., Montreal, Que
Jardine, J., Freetown, P.E.I

Jones, H. A., B.A., Moncton, N.B
Kannary, E. LeR., B.A., Northfield, Minn., U.S.A
Keating, B. H., Montreal, Que
Keating, H. T., Montreal, Que
MacKinnon, I. W., Charlottetown, P.E.I
Macpherson, C., St Johns, Nfld
McAuley, A. G., Ventnor, Ont
McConnell, R. E., B.A., Montreal, Que
McDiarmid, W. B., Maxville, Ont
McDonald, W. F., Westville, N.S
McDougall, A., Seaforth, Ont
McKee, S. H., B.A., Fredericton, N.B
McSorley, H. S., Montreal, Que
Martin, L. W., Warden, Que
Mellon, P. B., Ottawa, Ont
Morrison, A. S., Montreal, Que
Morrison G. D., Vankleek Hill, Ont
Morrow, J. J., Fergus, Ont
Moss, J. U., Montreal, Que
Murray, L. M., Truro, N.S
Mussen, A. T., Lachine, Que
O'Sullivan, M. T., Glace Bay, C.B
Paintin, A. C., Mansonville, Que
Paterson, A., B.A., Montreal, Que
Paterson, W. F., B.A., Montreal, Que
Pattee, F. J., Vankleek Hill, Ont
Patton, J. W. T., Ponds, N.S
Payne, R. H., Jamaica, W.I
Peake, E. P., B.A., Oshkosh, Wis., U.S.A
Pittis, H., Plainfield, N.J., U.S.A
Pope. E. L., B.A., Belleville, Ont
Porter, A. S., Powassan, Ont
Reynolds, F. L., St John, N.B
Richard, F. A., B.A., Richibucto, N.B
Robb, G. W. A., Oxford, N.S
Ross, H., B.A., Montreal, Que
Rowley, W. E., B.A., Marysville, N.B
Rutherfurd, A. E., Montreal, Que
Sayre, T. D., Amherst, N.S
Secord, E. R., Brantford, Ont
Shaughnessy, C. R., St Stephen, N.B
Snyder, A. E. W., Coaticooke, Que.
Stevenson, R. H., Dansville, Que
Symmes, C. R., Aylmer, Que
Todd, J. L., B.A., Victoria, B.C
Turnbull, J. A., Bear River, N.S
Turner, W. G., Quebec City, Que
Townshend, C., Parrsboro. N.S
Wilson, W. A., Carleton Place, Ont
Wood, D. F., Faribault, Minn., U.S.A
Wood, J. H. M., Montreal, Que

FACULTY OF ARTS.

Undergraduates.

FIRST YEAR.

Name.	*School.*	*Residence.*
Anderson, Alex. K.,	Private Tuition,	Coban, Guatemala, S.M.
Budyk, J. S.,	Montreal H. S.,	Montreal.
Cameron, Dakers,	Abingdon School, Montreal,	Montreal.
Couture, Gui. C.,	Montreal High School,	Montreal.
Davidson, Macfarlane B.,	Ottawa Coll. Inst.,	Ottawa, Ont.
Davies, Thos. A.,	Upper Canada Coll.,	Charlottetown, P.E.I.
Dunlop Alan C.,	Montreal High School,	Montreal.
Dutaud, Gustave,	Feller Inst., Grande Ligne,	St. Blaise, Q.
Fripp, Geo. D.,	Ottawa Coll. Inst.,	Ottawa, Ont.
Gnaedinger, Ernest G.,	Montreal H. S.,	Montreal.
Halpenny, T. Anson,	Sydenham H. S.,	Bearbrook, Ont.
Hanington, Jno. W. B.,	Collegiate School, Victoria, B.C.,	Victoria, B.C.
Harris, Alan Dale,	Private Tuition,	Ottawa, Ont.
Healy, Walter J.,	St. Francis Coll. School,	Richmond, Q.
Holman, Wm. L.,	Prince of Wales Coll.,	Summerside, P.E.I.
Johnson, Walter S.,	Montreal High School,	Montreal.
Joseph, H. Pinto,	Quebec H. S.,	Quebec Q.
Lomer, Gerhard R.,	Montreal H. S.,	Montreal.
McCracken, Robt. H.,	Huntingdon Acad.,	Huntingdon, Q.
McKellar, Hugh,	Vankleek Hill, Ont.,	Martintown, Ont.
McLeish, John,	Private Tuition,	Montreal.
MacKay, Eric B.,	Abingdon School,	Montreal.
MacMillen, Hy. H.,	Prince of Wales Coll.,	Alberry Plains, P.E.I.
McMorran, T. S.,	Ottawa Coll. Inst.,	Ottawa, Ont.
Mowatt, Edward E.,	Huntingdon Acad.,	Montreal.
Parkins, Edgar R.,	Montreal High School,	Montreal.
Pattison, Albert M.,	Clarenceville Model School.	Clarenceville, Q.
Philps, Wm. K.,	Huntingdon,	Huntingdon, Q.
Pownall, Edward W.,		Montreal.

Name.	*School.*	*Resiaence.*
Seaman, Jno. C.,	Montreal Dioc. Theol. Coll.	Otter Lake, Q.
Simister, Varren,	Montreal H. S.,	Montreal.
Simpson, G. A.,	Montreal H. S.,	Montreal.
Sutherland, Forbes D.,	Private Tuition.	Montreal.
Troop, G. Wm. H.,	M. Dioc. Theol. Coll.,	Montreal.
Wilson, Thos. J.,	M. Dioc. Theol. Coll.,	Shawville Q.

SECOND YEAR.

Adams, Chauncey A.,	Stanstead Wesleyan Coll.,	Coaticook, Q.
Ascah, Robt. G..	M. Dioc. Theol. College,	Peninsula, Gaspé, Q.
Blagrave, Robt C.,	M. Dioc. Theo. College,	Rawdon, Q.
Browne, H. Dalzell,	McGill Coll.,	Montreal.
Carlyle, Ernest J.,	Woodstock Coll. Institute,	Woodstock, O.
Carson, Hermon A.,	Danville Academy,	Nicolet Falls, Q.
Cole, Geo. E.,	Institute Feller,	Westmount, Montreal.
Crothers, Harold R.,	St. Francis Coll. School,	Venice, Q.
Crowell, Sam. G.,	Yarmouth Academy, N-S.	Yarmouth, N-S.
Fox, Frank H.,	Private Tuition,	Montreal.
Harris, Spencer L. D.,	Private Tuition,	Ottawa, O.
Ireland, F. Chas.,	Montreal Coll. Institute,	Montreal.
Jack, Milton.	Montreal Coll, Institute,	Chateauguay Basin, Q.
McDonald, Jno. A.,	Huntingdon Academy,	Valleyfield, Q.
Muir, Kenneth C.,	Huntingdon Academy,	Huntingdon, Q.
Munn, W. Clement,	Quebec High School	Quebec.
Murphy, Herbert H.,	Almonte High School,	Antrim, O.
Ogilvie, Guy,	Abingdon School,	Montreal.
Parker, Dan. T.,	Lachute Acad.,	Cambria, Q.
Plant, Verner L.,	McGill Coll.,	Montreal.
Price, Joe,	Private Tuition,	Campbelltown, N. B.
Pruyn, Wm. G.,	Napanee Coll. Institute.	Napanee, O.
Walker, Jno. J.,		

THIRD YEAR.

Name.	*Residence.*
Anderson, Richard S.,	Kenlis, Assa.
Barrington, Fred. H.,	Waterloo, Q.
Boulter, J. Henry.,	Demorestville, O.
Brodie, Hugh H.,	St Henry, Montreal.
Brown, Albert V.,	Montreal.
Charters, Herbert,	Montreal.
Chipman, Warwick F.,	Montreal.
Copeman, Joseph Hodge,	Quebec.
Cotton, Wm. U.,	Sweetsburg, Q.
Dickson, Norval,	Allan's Corners, Q.
Fuller, George D..	Adamsville, Q.
Harper, Robert J.,	Montreal.
Hickson, Robert N.,	Montreal.
Lindsay, J. Edwin,	Rawdon, Q.
Lochead, Arthur W.,	North Gower, O.
McCormick, Alex. S.,	Westmount, Montreal.
McDonald, John,	Montreal.
McEwen, John R.,	Dewittville, Q.

Name.	*Residence.*
McLeod, Angus B.,	Springton, P.E.I.
McMurtry, Gordon O.,	Montreal.
McMurtry, Shirley, O.,	Montreal.
McNaughton Wm. G.,	Huntingdon Q.
McPherson Thomas,	Stratford, O.
Mitchell, Isaiah Edward,	Sherbrooke, Q.
Mitchell, Sydney C.,	Montreal.
Moffatt, Charles F.,	Montreal.
Molson, Percival,	Montreal.
Mount, Hector P.,	Montreal.
Mowatt, Joseph A.,	Montreal.
Scott, Wm. J.,	Montreal.
Scrimger, Francis A.,	Montreal.
Stephens, Laurence,	Montreal.
Strong, Norman W.	Cambria, Q.
Tees, Fred. J.,	Montreal.
Viner, Norman,	Montreal.
White, D. Roderick,	Huntingdon, Q.
Williams, Hy. S.,	Knowlton, Q.

FOURTH YEAR.

Name.	*Residence.*
Ainley, Laurence,	Almonte, O.
Cochrane, Donald,	Montreal.
Cohen, Abraham,	Montreal.
Cooke, H. Lester,	Montreal.
Crack, Isaac E.,	Kingsbury, Q.
Crowell, Bowman C.,	Yarmouth, N.S.
DeWitt, Jacob,	Montreal.
Dixon, James D.,	Montreal.
Elder, Robert,	Trout River, Q.
Ells, Sydney C.,	Ottawa, O.
Ferguson, Colin C.,	Marshfield, P.E.I.
Forbes, Wilfrid,	Vernon River Bridge. P.E.I.
Grier, Geo. W.,	Montreal.
Hardy, Chas. A.,	Fortune Cove, P.E.I.
Johnson, J. Guy W.,	Montreal
Lee, Hy. S.,	Kamloops, B. C.
Laverie, Jas. H.,	Lauzon, Levis, Q.
Mackinnon, Cecil G.,	Cowansville, Q.
Macmillan, C. J.,	Charlottetown, P.E.I.
Millar, W.	Kinlock, Pembroke, Ont.
Newson, Wm. V.,	Charlottetown, P.E.I.
Nutter, J. Appleton,	Montreal.
Radford, E. Alan,	Montreal.
Reford, Lewis,	Montreal.
Ritchie, Charles F.,	Montreal.
Rowell, Arthur H.,	Montreal.
Scott, George W.,	Montreal.
Scott, Harry E.,	Napanee, O.
Stewart, Donald,	Dunbar, O.
Walker, Horatio,	L'Ile d'Orléans, Q.
Weinfield, Henry,	Montreal.
Willis, Samuel J.,	Kingston, P.E.I.
Woodley, Edward C.,	Montreal.

Partial Students.

A Student who is not an Undergraduate, or Graduate, is called a Partial Student.

The figure (1), (2), or (3), prefixed to a name, indicates that the Student takes a class in the corresponding year as well as in that where the name is found.

FIRST YEAR.

Name.	*Residence.*
Browne, Wm. H,	Montreal
Burns, Robt.,	Ottawa, O.
Chancey, Sydney A.,	St John's, Nfld.
Claris, Chas. C.,	London, O.
Cruchon, Chas. F.,	Curgon, Ain, France.
Duncan, Jas. H.,	Haverhill, Mass. U. S.
Gray, Edwin H,	Montreal.
Hamilton, Wm. J.,	
Hogan, Jno.,	Montreal.
Hunter, Joseph D.,	Victoria, B. C.
Jordan, Geo. A.,	Coaticook, Q.
McDougall, W. M. M. Errol.	Klock's Mills, O.
Mackenzie, Jno. D.,	Inverness, Q.
May, Wm. H.,	Forester's Falls, O.
Mitchell, Geo. S.,	
Morgan, Harold M.,	
Rondeau, Albert G.,	Hull City, Q.
Shallow, T. J.,	Ste Anne de Bellevue, Q.
Sims, Haig A.,	Montreal.
Touchette, Wm. F.,	Frenchtown. Messoulee Co., Mont., U. S.
Woodside, Jas. H.,	St Sylvestre West, Q.
Woodside, Jno. W.,	St Sylvestre West, Q.

SECOND YEAR.

Boyd, Alfred L.,	Melcalfe, O.
Carruthers, Chris.,	Aylwin, Q.
(1) Cruchon, Chas. F.	
(1) Chancey, Sydney A.	
Greig, Jno. G.,	Montreal.
Ireland, A. A.,	Montreal.
Joliat, Henri.,	Montreal.
Laughlin, Wm. A.,	Toronto, O.
Luttrell, H. P.	Montreal.
McKelvey, Irving A.,	Stratford, O.
(1) Mackenzie, Jno. D.	
McLeod, N. V.,	Granby, Q.
Mathieson, Peter,	Forester's Falls, O
(1) Mitchell, Geo. S.	
Morrow, J. D.,	Toronto, O.
Robertson, Harry D.,	Almonte, O.
(1) Rondeau, Albert G.	
Stillman, Harry W.,	Campbellford, O.
(1) Swinton, J.	
(1) Touchette, Wm. F.	
Turkington, Edward.,	Marlbank, O.
(1) Woodside, Jas. H.	
(1) Woodside, Jno. W.	
Wotherspoon, Hugh.,	Montreal.

THIRD YEAR.

Ashton, W., J., Gorrie, O.
) Boyd, Alfred L.
Edwards, Jno. A., Liverpool, Eng.
Greenaway, R. Brandon., Hamilton, O.
Irving, Geo., Vernon River Bridge, P.E.I.
(2) McElvey, Irving, A.
Sawyer, Thos. E., Woodham, O.
(2) Stillman, Harry W.
Sutcliffe, J. Fletcher., Camlochie, O.
Swinton, J., Rockton, O.

FOURTH YEAR.

(3) Ashton, W. J.
Bailey, T. W., Pakenham, O
Barker Arthur L., London, O.
Clarke, Wm. H., Halloway O.
Coone, A. W., Manilla, O.
(3) Greenaway, R. Brandon.
Hamilton, W. A., Carleton Place, O.
Lloyd, A. E., Thamesville, O.
(2) Luttrell, H. P.
(2) Mathieson, Peter.
Millyard, J. Edwin, Exeter, O.
Rowan, W. L,. Pembroke, O.
(3) Sawyer, Thos. E.
(3) Swinton, J.
Taylor, Alfred M., Montreal.
(2) Turkington, Edward,
Vickery, Thos. J., Smith's Falls, O.

B. A.

Keith, Hy. J., Smith's Falls, O.

ROYAL VICTORIA COLLEGE.

Undergraduates.

FIRST YEAR.

Name.	*School.*	*Residence.*
Augus, Jean M.,	Westmount Acad.,	Montreal
Belyea, Marion E.,	H. S., St John, N. B.,	St. John, N. B.
Dease. Jean P.,	Montreal G. H. S.,	Montreal.
Dickson, Ada D.,	Pembroke H. S.,	Pembroke, Ont.
East, Edith M.,	Montreal Coll. Ins..,	Maisonneuve, Montreal.
Fyles, Winifred.	Quebec G. H. S.	Levis, Q.
Hadrill, Margaret, F.	Montreal G. H. S.,	Montreal.
Lundie, Helen,	Montreal G. H. S ,	Montreal
McLeod, Euphemia L.,	Montreal G. H. S.,	Montreal.
Parkin, Maude E.,	Bishop Strachan School,	Toronto, O.
Wales, Julia G ,	Cookshire Acad.,	Robinson, Q.
Wisdom, Katherine F.,	St John H. S.,	St. John, N. B.
Woodley, Florence E.,	Westmount Acad.,	Westmount, Montreal

SECOND YEAR.

Baillie, Muriel L.,	Westmount Academy,	Westmount, Montreal.
Bickerdike, May C.,	Montreal G. H. S.,	Lachine, Q.
Clogg, Vivian E.,	Westmount Acad.	Montreal.
Day, Daisy W.,	Montreal G H.S.,	Montreal Annex.
Dixon, Jennie D.	The Misses Gardiner & McGill Normal S.,	Montreal.
Ellison, Ada A.,	McGill Normal School,	Cowansville, Q.
Greenleese, Mary S.,	Misses Symmers & Smith's School,	Montreal.
Hitchcock, Caroline L.,	Brockville Coll. Inst.,	Brockville, O.
Irving, Elizabeth,	Prince of Wales Coll., P.E.I.,	Vernon River Bridge. P.E.I.
McLachlan, Jessie W.,	Guelph Coll. Inst.,	Guelph, O.
Nolan, Annie W.,	Westmount Academy,	Westmount, Montreal
Noyes, Emily M.,	Montreal Coll. Inst.,	Cowansville, Q.
Smith, Miriam G.,	Morrisburg Coll. Inst.,	Morrisburg, O.
Warriner, J. Eva,	M. G. H. S. & Private Tuition,	Montrea l

THIRD YEAR.

Name.	*Residence.*	*Name.*	*Residence.*
Bennett, C. Winifred,	Montreal.	Molson, Evelyn,	Montreal.
Flint, Mary F.,	Stanstead, Q.	Page, Harriet A.,	North Troy, Vt.
Huxtable, Gertrude M.,	Montreal.	Radford Isabel,	Montreal.

FOURTH YEAR.

Name.	*Residence.*	*Name.*	*Residence.*
Dey, Mary Helena,	Simcoe, O.	McGregor, Claire R.,	Victoria, B.C.
Garlick, Edythe A.,	Montreal.	Marcuse, Bella,	Westmount, Montreal.
Holman, Caroline E.	Summmerside, P.E.I.	Perley, Frances B.	Upper Maugerville, Sunbury Co., N.B.
Jackson, E. Gertrude,	Montreal.	Rorke, Helen,	St. Thomas, O.
Lundie, Jessie F.,	Montreal.	Smith, Lillian A.,	Morrisburg, O.

Partial Students.

FIRST YEAR.

Name.	*Residence.*	*Name.*	*Residence.*
Acer, Edythe J.,	Montreal.	Hagar, Winifred,	Montreal.
Armstrong, H. Evelyn	Montreal.	Hiam, Amy M.,	Montreal.
Bacon, Charlotte E.,	Montreal.	Howard, Mary G.,	Laurenceville, Q.
Bethune, Edith.,	Montreal.	Kerr-Kaye, G. M.,	Montreal.
Brock, Kate S.,	Montreal.	Lindsay, K. Ada,	Montreal.
Burgess, Lina D.,	Wolfville, N. S.	Matthewson, Amy	Montreal.
Cox, K.,	Montreal.	Michalson, Mary,	Montreal.
Currie, Ruby,	Montreal.	Nairn, Caroline,	Toronto, O.
Doyle, Rosie A.,	Montreal.	Pridham, Mabel A.,	Grenville, Q.
Drummond, Mary,	Montreal.	Rodger, Edith M.,	Montreal.
Fulford, Dorothy M.,	Brockville, O.	Shepherd, Lois,	Montreal.
Fulford, Martha H.,	Brockville, O.	Stevenson, Armande C.,	Montreal.
Gardner, Ivy,	Montreal.	Von Rappard, Irene G.,	Montreal.
Gass, Helen, B.,	Montreal.	Williams, A. Maude,	Montreal.
Gillean, Evelyn M.,	Montreal.	Young, Gertrude M.,	Montreal.

SECOND YEAR.

(1) Bethune, Edith.		Lewis Stephanie,	Montreal.
Campbell, Roslyn,	Montreal.	Meighen, Margaret S.,	Montreal.
Fortier, Georgina H.,	Montreal.	Pinder, Alice C.,	Montreal.
(1) Fulford, Dorothy M.		(1) Pridham, Mabel A.	
Going, E. Maud,	Montreal.	Prowse, Florence,	Montreal.
Gould, Emily De W.,	Montreal.	(1) Rodger, Edith M.	
Kingsley, Alice M.,	Montreal.	Stephen, Frances H. B.,	Montreal.
Lacy, Madge E.,	Montreal.	(1) Stevenson, Armande C.	
Lamb, M. L.,	St Andrews East, Q.	(1) Young, Gertrude M.	

THIRD YEAR.

Browne, Joanna,	Montreal.	Plimsoll, Gladys,	Montreal

FOURTH YEAR.

Carter, Mabel A., Cowansville, Q.
Evans, Catherine L. A., Montreal.
Hanson, Florence M., Montreal.
Hanson, Kate, Montreal.
(2) Lacy, Madge E.
(2) Lamb, M. L.
Mackay, Jeanie, Montreal.
(2) Meighen, Margaret S.
Richardson, Mabel H., Montreal.
Stephen, Olivia, Montreal.

B. A.

Armstrong, Ethel, Montreal.
Carr, Muriel B., St. John, N. B.
Craig, Margaret, Montreal.
Dover, M. V., Peterboro, O.
Finley, Kathleen, Montreal.
Johnson; Helena, Montreal.
McGill, I. Winifred, Ottawa, O.
Reid, Lena McK., Montreal.
Scrimger, Anna M., Montreal.
Tatley, Eleanor, Montreal

FACULTY OF APPLIED SCIENCE.

FIRST YEAR.

Anderson, Lewis B., Lunenberg, N.S
Baker, William E., Montreal
*Barclay, Charles H., St Paul, Min., U.S.A.
Barclay, Malcolm D., Montreal
Blatch, Harry E., St John's, Nfld
Boright, Sherman H., Sutton, Q
Brown, Frederick B., Montreal
Cameron, John A., Hamilton
Cassils, Charles W., Montreal
Cohen, Harris, Montreal
Cole, G. Percy, Montreal
Cooper, Frank W., London, O
Cushing, Gordon C
Denne, Reginald D. L., Montreal
Eaton, E. Courtland, Westmount, Q
Foreman, Alvah E., Vancouver, B.C
Fraser, Thomas C., New Glasgow, N.S
*Fraser, Russell L., New Glasgow, N.S
Gale, George G., Quebec, Q
Gault, Andrew H. Montreal
Gillies, George A., Carleton Place, O
Graham, William F., Dundas, O
Hall, Oliver, Washington, O
*Hamilton, Wilfred, Montreal
*Harris, Alan Dale, Ottawa, O
Hayes, Albert O., Granby, Q
Hayne, Fergus C., Montreal
James, Bertram, Heart's Content, Nfld
Jones, Harold W., Ottawa, O
Keith, Fraser S., Smith's Falls, O
Kendall, George, Vancouver
Kerr, Allison P. R., Westmount, Q
Lambart, Howard F., New Edinburgh, O
Landry, Pierre A., Dorchester, N.B
Langley, Albert G., Victoria, B.C
*Lewis, Burwell B., Baltimore, Md., U.S.A.
Lockerby, Robert A., Montreal
Macfarlane, Peter A., Chateauguay, Q
MacLeod, Russell M., Buffalo, N.Y., U.S.A.
McCaskill, Kenneth A., Barb, O
McDonald, James F., Westville, N.S
McKay, Frederick A., Montreal
McKergow, Charles M., Westmount, Q
Meldrum, Robert H., Montreal
*Morgan, Harold M., Ste Anne de Bellevue, Q
Morse, William H., Bridgetown, N.S.
Musgrave, Robert, Duncans, B.C
Musgrave, William H., Duncans, B.C
Oakes, Francis H., Boston, Mass., U.S.A
Peaslie, Alexander S. L., Defiance, Ohio, U.S.A
*Peck, Warren G., Montreal
Pemberton, William P.D., Gonzales, Victoria, B.C
Porter, William J. D. A., Douglastown, N.B.
Roberts, Arthur R., Montreal
Ross, James C., Embro, O
*Riley, George C., Montreal
Richards, Charles C., Charlottetown, P.E.I.
Robillard, Edmond G. F., Montreal
Rodger, Herbert F., St John's, Nfld
Rowlands, Charles, Albany, N.Y., U.S.A
Savage, George M., Montreal
Sims, Harold H., Montreal
Smith, Ralph E., Windsor, N.S
Stovel Joseph H., Coraopolis, Pa., U.S.A
Sutcliffe, Paul, Poughkeepsie, N.Y., U.S.A
Thorpe, William H. Montreal
Tilt, Edwin B., Goderich, O
Trimingham, Charles L., Barbadoes, W.I
*Valières de St Real, Henry B., Three Rivers, Q
Warrington, John E., Montreal
Whiteway, F. H. Clare, St John's, Newfoundland
Yuile, Herbert, Montreal

SECOND YEAR.

Addie, Thomas H., Sherbrooke, Q
Baird, Alexander, Sherbrooke, Q
Barwick, William, S., Barrie, O
Beaudry, Victor, Montreal
Beck, Alfred E., Penetanguishene, O
*Biggar, Howell, Ottawa, O
*Blanchet, M. John S., Quebec. Q
Borden, Henry P., Kentville, N.S
Boyd, Hugh H., Montreal
Brainerd, Herbert W., Montreal
Brecken, Walter R., Charlottetown, P.E.I
Campbell, Charles McK., Winnipeg, Man
Cape, Ernest K., Hamilton, O
Corless, Charles V., New Durham, O
Coulson, John D., Toronto. O
Crawford, Stuart, Montreal
DePencier, Henry P., Vancouver. B.C
Dunfield, John C. W., St John's, Newfoundland
Dupuis, Albert, Montreal
Edgar, John H., Montreal
Hartz, Rutherford S., Richmond, Va., U S.A
Heamon, John A., London, O
Hicks, Thomas N., Perth, O
Jackson, Philip T., Toronto, O
*Johnston, Christopher F., San Diego, Cal., U.S.A.
Lawrence, Hugh R., St George, N.B.
MacKay, Eric, St John's, Nfld
MacKeen, Rupert T., Windsor, N.S
Maclaren, Francis H., Huntingdon, Q
Mathers, William R., St John, N.B.
McBride, Wilbert C., Inglewood, O
Meyers, Archie J., Listowel, O
Murphy, William E., Shelburne, N.S
Newton, Samuel R.,, Drummondville, Q
Pearson, Hartley M. Huntingdon, Q
Peck, Thomas E. Montreal
Porcheron, Alphonse, Montreal
Pratt, Stephen S., Cranbrook, B.C
Ralph, Claude E., Ottawa, O
Robertson, John F., Charlottetown, P.E.I.
Scott, Harry E., Napanee, O
Sewell, Alexander L., Quebec, Q
Smith, Gerald M., St Johns, Q
Smith, J. Macdonald, Petitcodiac, N.B
Sterns, Frank E., Morell, P.E.I
*Ward, Roger, Montreal
Weagant, Roy A., Derby Line, Vt., U.S.A
*Whitley, Herbert A., Montreal

THIRD YEAR.

Archer, Augustus R., New York, U.S.A.
Blanchard, Arthur C. D., Windsor, N,S.
Blue, Allen P., Eustis, Q
Burchell, Geo. B., New Campbellton, N.S
Burson, Herbert A., St. Catharines, O
Burwell, Ernest V., London, O
Cameron, Hugh D., Montreal
Clement, Sheldon B., Clinton. O
Coussirat, Henri A., Montreal
Cowen, Edwin A. A., Montreal
DeBlois, William H., Halifax, N.S.
Edwards, William M., Ottawa, O
Flint, William G., Montreal
Forman, Andrew S., Montreal
Fraser, Donald C , New Glasgow, N.S.
Frechette, Howells, Ottawa, O
Gagnon, Edmund E., Montreal
Galbraith, Malcolm T., Montreal
Glassco, Archie P. S., Hamilton, O
Green, Alfred H., St. John, N.B.
Hampson, E. Greville Montreal
Higman, Ormond, Ottawa, O
Howard, Rupert F,, Lachine, Q
*Hutchings, Geo. H., Hamilton, Bermuda
*Hutchings, Somers C., Hamilton, Bermuda
Jamieson, George E. T., Montreal
Labatt, John S., London, O
Lloyd, Herbert M., New Westminster, B.C.
Lowden, Warden K. Montreal
McKenzie, Bertram S., London, O
McLaren, John H., Montreal
Millar, James L., Pembroke, O
Ogilvie, Paul, Cummings' Bridge, O
Palmer, Ernest E., Toronto, O
Paterson, Charles S., Montreal
Pyke, Gordon McT., Montreal
Reynolds, Leo B., Waterford, O
Ritchie, Joseph N., Halifax, N.S.
Schwitzer, Thomas H., Ottawa, O
Scott, Henry M., Montreal
Taylor, Charles W., Richwood, O
Tupper, Charles, Vancouver, B.C.
Wakeling, Otty S., St. John, N.B.
Ward, Percy W., Lachine, Q
White, Gerald V., Pembroke, O
Wilson, Reginald C., Cumberland, O

FOURTH YEAR.

Allan, Leigh, Tacoma, Wash., U.S.A.
Allen, Samuel J., Maitland, N.S.
Andrews, Edward, Grimsby, O
Arkley, Lorne M., East Angus, Q
Bachand, George A., Montreal
Barber, Rene R., Georgetown, O
Buchanan, Fitzherbert P., Montreal
Burgoyne, Stanley J., Halifax, N.S.
Byers, Archibald F., Gananoque, O
*Gary, George M., Goderich, O
Cornwall, Clement A. K., Ashcroft, B.C.
Corriveau, Raoul de B., Iberville, Q
Cowans, Frederick, Montreal
*Donaldson, Hugh W., Hamilton, O
Duncan, G. Rupert, Montreal
Ewart, George R., Kilauea, Kauai, Hawaiian Islands
Fraser, John W.. Charlottetown, P.E.I
Gillean, R. Hampson, Montreal
Glassco, Jack G., Hamilton, O
Hamilton, George M., Peterboro, O
*Howard, Lawrence O., Lachine, Q
Leman, Beaudry, Montreal
*Maclaren, George McC., Ottawa, O
Macmaster, Arthur W.. Montreal
*McMillan, George P., Petrolia, O
Miller, Angus K., Bridgeburg, O
Montgomery, George, Morrisburg, O

Moore, Ernest V.,	Peterboro, O	Robertson, Philip W. K.,	Mexico City Mexico
Nelson, George J.,	Halifax, N.S.		
Neville, Thomas P. J.,	Halifax, N.S.	Shepherd, Harry L.,	Brockville, O
Nicholls, Henry G.,	Toronto, O	Sise, Paul F.,	Montreal
Osborne, J. Ewart,	Toronto, O	Smith, George R.,	Stratford, O
*Parizeau, Henri D.,	Boucherville, Q	*Staveley, Edward B.,	Quebec. Q
Percy, Howard M.,	Montreal	Stevens, Angus P.,	Dunham, Q
Pergau, Harry,	Lyn, O	St. George, Harry L.,	Montreal
		Walker, Frank W.,	Montreal

POST GRADUATES.

Archibald, Ernest M., B.Sc.,	Halifax, N.S.	Maclennan, Frank W., B.A.Sc.,	Cornwall, Ont.
Denis, Leopold, B.Sc.,	Montreal		
Fraser, James W., B.Sc.,	Bridgeville, N.S.	Morgan, Charles B., B.Sc.,	Hamilton, Ont.
Grier, Arthur G., B.Sc.,	Montreal	Young, George A., B.A.Sc.,	Kingston, Ont.
Hyde, James C., B.Sc.,	Montreal		

Partial Students.

Connolly, Frank,	Montreal	Scott, George W.,	Montrea
Dawson, B.,	Montreal	Smith, Richard W.,	Cahir, Ireland
Gaskill, James Phillips,	Woonsocket, R.I., U.S.A.	Stewart, Andrew,	Craigmuir, Lenzie, Scotland
Gault, Miss L.,	Montreal	Stuart, Charles J.,	Montreal
Houliston, John,	Three Rivers, Que.	Thomson, James A.,	Hamilton, Ont
Northwood, George W.,	Ottawa, O.	Viggars, Charles,	Chester, Eng
Sands, Henry H.,	Montreal	Wilson, Charles E. A.,	Vancouver, B.C

FACULTY OF COMPARATIVE MEDICINE AND VETERINARY SCIENCE.

FIRST YEAR.

Blair, W. Reid,	Chicohee, Mass.	Hanington, Arthur D.,	Guysboro, N.S.
Clark, Arthur S.,	Hubbardston, Mass.	Howden, Seymour,	Duncans, B.C.
Douglas, A. R.,	Montreal	Spear, Wm. H.,	Burlington, Vt.
Doyle, L.,	Montreal		

SECOND YEAR.

Amyrauld, O.,	Sweetsburg, Q.	Rork, John T.,	Roxbury, Mass.
Kennedy, Geo. A.,	Hemmingford, Q.	Tamblyn, David,	Berks, Eng.
Manchester, Walter,	Sussex, King's Co., N.B.		

THIRD YEAR.

Allen, Frank T.,	Springfield, Mass.	Smith, Wm. C.,	Winnipeg, Man
Humphreys, B. F.,	Boston, Mass.	Stanbridge, Geo. W.,	Hubbardston, Mass

COLLEGES AFFILIATED IN ARTS.

MORRIN COLLEGE, QUEBEC.

Undergraduates.

FIRST YEAR.

Raymon, Florence M. C.,	Snaith, William,

SECOND YEAR.

Gibson, George,	Munn, Emma,
Miller, William,	

THIRD YEAR.

Fraser, Ella M.,	Smith, Esther M.

FOURTH YEAR.

Fyles, Faith,

STANSTEAD WESLEYAN COLLEGE.

Undergraduates.

FIRST YEAR.

Bridgette, Samuel J.,
Cole, Kate E.,
Lockhart, Arthur R. B.,

Partial Students.

Graham, R. W.

VANCOUVER COLLEGE.

Undergraduates.

FIRST YEAR.

Burpee, Ethel Louise,
Campbell, Jessie Lucinda,
Ford, Harry Smyth,
McConaghy, James Archibald,
Paul, Margaret Anderson,
Philip, Alice May.

Partial Student.

DeWolf, Elsie St Etienne.

SUMMARY.

Students in Law, McGill College				63
" in Medicine, "				456
" Arts :—				
	Men	Graduates	1	
		Undergraduates	128	
		Partial	54	287
	Women	Graduates	10	
		Undergraduates	43	
		Partial	51	
Students in Arts, Morrin College				8
" " Vancouver College				7
" " Stanstead College				4
" " Applied Science, McGill College :—				
		Undergraduates, Partial and Graduates		232
" " Veterinary Science				16
				1073
McGill Normal School, Teachers-in-training				145
				1218
Deduct, repeated in different lists				18
Total				1200

University Societies.

GRADUATES' SOCIETY OF McGILL UNIVERSITY.

INCORPORATED 24TH JULY, 1880.

President—Charles Wilson, M.D.

Vice-Presidents—C. W. Colby, M.A., Ph.D.; Miss Helen R. Y. Reid, B.A.; Archibald MacArthur, B.A.

Secretary—J. Claud Hickson, B.A., B.C.L.

Treasurer—Francis Topp, B.A., B.C.L.

Resident Councillors—A. Rives Hall, B.A., B.C.L.; Frank D. Adams, M.A., Ph.D.; Homer M. Jaquays, M.A.Sc.; Malcolm C. Baker, D.V.S.; N. Norton Evans, M.A.Sc.; E. Fabre Surveyer, B.A., B.C.L.

Non-Resident Councillors—The Presidents of the British Columbia Graduates' Society, the New England Graduates' Society, the New York Graduates' Society, the Nova Scotia Graduates' Society, and the Hon. W. W. Lynch, D.C.L., Knowlton, Que.

McGILL APPLIED SCIENCE SOCIETY.

Hon. President—Dr. H. T. Bovey.

Advisory Committee—Prof. F. D. Adams, J. M. McCarthy, M. L. Hersey, A. L. Mudge, R. F. Ogilvy.

Hon. Sec.-Treasurer—J. G. G. Kerry, Engineering Building, McGill University.

President—H. A. Burson, Electrical Engineering, '01.

1st Vice-President—B. S. McKenzie, Mining Engineering, '01.

2nd Vice-President—S. B. Clement, Civil Engineering, '01.

3rd Vice-President—R. C. Wilson, Mechanical Engineering, '01.

Secretary—C. V. Corless, '02.

Treasurer—A. E. Beck, '02.

2nd Year Representative—E. J. Mackay, '02.

Editorial Board—A. R. Archer, '01, Chairman; H. E. Scott, G. Tike, J. A. Hearmon.

ALUMNÆ SOCIETY OF McGILL UNIVERSITY.

President—Helen R. Y. Reid, B.A.
Vice-Presidents—Jessie Brown, B.A.; Carrie M. Derick, M.A.
Treasurer—Susan E. Cameron, M.A.
Rec. Secretary—Ethel Radford, B.A.
Assist. Rec. Secretary—Louise McDougall, B.A.
Cor. Secretary—Frances R. Angus, B.A.
Assist. Cor. Secretary—Louise Smith, B.A.

OTTAWA VALLEY GRADUATES' SOCIETY OF McGILL UNIVERSITY.

ORGANIZED 1890.

Hon. President—The Right Hon. Sir Wilfrid Laurier, P.C., K.C.M.G., LL.D.

President—W. Carden Cousens, M.D., C.M., L.R.C.P.

Vice-Presidents—G. H. Groves, M.D., C.M.; P. D. Ross, B.A.Sc.; A. T. Shillington, M.D., C.M.

Secretary—D. B. Dowling, B.A.Sc. (Geological Survey, Ottawa).

Treasurer—G. S. McCarthy, M.D., C.M.

Council—G. C. Wright, B.A., B.C.L.; H. M. Ami, M.A., D.Sc.; S. P. Cooke, M.D., C.M.; J. H. Larmonth, B.A.Sc.; E. L. Quirk, M.D., C.M.

Deputy Examiners—D. B. Dowling, B.A.Sc., and M. F. Connor, B.A.Sc.

NEW YORK GRADUATES' SOCIETY OF McGILL UNIVERSITY.

ORGANIZED 1895.

President.

1st Vice-President—Wolfred Nelson, M.D., C.M., F.R.G.S.

2nd Vice-President—James A. Meek, M.D., C.M.

3rd Vice-President—Hiram N. Vineberg, M.D., C.M.

Treasurer—R. A. Gunn, B.A.Sc.

Secretary—W. Ferguson, M.D., C.M. (948 E. 166th St., New York).

Executive Committee—Rev. J. J. Rowan Spong, M.A., B.C.L., LL.B.; Harcourt Bull, B.A.; J. B. Harvie, M.D., C.M. (Troy).

Non-Resident Councillors—Wm. Osler, M.D., C.M., F.R.C.P.L., F.R.S. (Baltimore, Md.); Rev. J. C. Bracq, Vassar College, N.Y.; Right Rev. J. D. Morrison, M.A., D.D., Bishop of Duluth; R. T. Irvine, M.D., C.M.

McGILL GRADUATES' SOCIETY OF TORONTO.

ORGANIZED 1896.

President—A. R. Lewis, Q.C.
1st Vice-President—Rev. Canon Sweeny, M.A., D.D.
2nd Vice-President—H. C. Burritt, M.D.
Secretary-Treasurer—R. B. Henderson, B.A., 48 King Street, West
Committee—Hamilton Cassels, B.A.; Willis Chipman, B.A.Sc.; P. E. Ritchie, B.A.

THE BRITISH COLUMBIA SOCIETY OF GRADUATES OF McGILL UNIVERSITY.

President—R. E. McKechnie, M.D. (Nanaimo).
Vice-Presidents—W. F. Ferrier, B.A.Sc. (Rossland); R. W. Jakes, M.D. (Greenwood); W. F. Robertson, B.A.Sc. (Victoria); W. S. Johnson, B.A.Sc. (Slocan City).
Secretary—W. J. McGuigan, M.D., LL.B. (Vancouver).
Treasurer—Simon J. Tunstall, B.A., M.D. (Vancouver).
Executive Committee—R. E. Palmer, B.A.Sc. (Rossland); J. M. McGregor, B.A., B.A.Sc. (Slocan City); J. M. Lefevre, M.D. (Vancouver); D. B. Holden, B.A., M.D. (Victoria); H. W. Mussen, B.A.Sc. (Nelson).

THE NEW BRUNSWICK GRADUATES' SOCIETY OF McGILL UNIVERSITY.

ORGANIZED 1896.

President—F. H. Wetmore, M.D. (Hampton, N.B.).
Vice-President—B. S. Price, M.D. (St. John, N.B.).
Secretary-Treasurer—J. H. Scammel, M.D. (76 Waterloo street, St. John, N.B.).
Executive Committee—J. H. King, M.D.; W. L. Ellis, M.D.

NOVA SCOTIA SOCIETY OF McGILL GRADUATES.

ORGANIZED 1896.

Hon. President—Rev. Robert Laing, M.A. (Halifax).
President—John McMillan, M.D. (Pictou).
1st Vice-President—F. S. Yorston, M.D. (Truro).
2nd Vice-President—James Ross, M.D. (Halifax).
Secretary-Treasurer—W. H. Hattie, M.D. (Nova Scotia Hospital for the Insane, Halifax).
Executive Committee—A. I. Mader, M.D.; Wm. Jakeman, D.V.S.; E. A. Kirkpatrick, M.D.; J. W. Clarke, M.D.

McGILL GRADUATES' SOCIETY OF THE DISTRICT OF BEDFORD.

ORGANIZED 1898.

Hon. President—Hon. W. W. Lynch, D.C.L. (Knowlton).
President—C. A. Nutting, Q.C. (Waterloo).
Vice-Presidents—D. K. Cowley, M.D. (Granby); A. D. Stevens, M.D. (Dunham); N. M. Harris, M.D.
Secretary-Treasurer—S. H. Martin, M.D. (Waterloo).

NEW ENGLAND SOCIETY OF McGILL GRADUATES

ORGANIZED 1899.

President—Arthur E. Childs, B.Sc., (Boston, Mass.).
1st Vice-President—George A. Fagan, M.D., (North Adams, Mass.).
2nd Vice-President—Ambrose Choquet, B.C.L. (Providence, R.I.).
3rd Vice-President—Rev. Robert W. Wallace, B.A. (Somerville, Mass.).
Secretary-Treasurer—Joseph Williams, M.D. (Boston, Mass.; 229 Berkeley Street).
Councillors—H. Holton Wood, B.A. (Boston, Mass.); John M. Parker, D.V.S. (Haverhill, Mass.); Robert MacDougall, B.A. (Boston, Mass.); T. G. McGannon, M.D. (Lowell, Mass.); A. S. Cleaves, D.V.S. (West Gardiner, Mass.); Miles Martin, M.D. (Boston, Mass.).

UNDERGRADUATES' LITERARY SOCIETY.

CONSTITUTED, 1880.

Hon. President—Principal Peterson.
President—W. G. McNaughton, Arts, '01.
Vice-President—E. W. Westover, Law, '01.
Secretary—C. A. Adams, Arts, '02.
Treasurer—M. Jack, Arts, '02.
Committee—W. S. Johnson, '03; A. W. Lochead, '01; C. W. Munn, '02; R. J. Harper, '01; E. Harper, '03.

DELTA SIGMA SOCIETY.

ESTABLISHED 1884.

President—Evelyn Molson.
Vice-President—Elizabeth Irving.
Secretary-Treasurer—Katharine Wisdom.
Committee—Bella Marcuse, Winifred Bennett, M. Gould Smith, Maud Parkin.

McGILL HISTORICAL CLUB.

President—H. S. Williams, Arts, '01.
Vice-President—A. W. Locheid, Arts, '01.
Secretary—S. Mitchell, Arts, ' 01.
Treasurer—C. C. Adams, Arts, '02.
Executive Committee—Prof. C. W. Colby, M.A., Ph.D.; E. C. Woodley, Arts, '00; E. G. Place, B.A., Law, '01.

THE McGILL MINING SOCIETY.

ORGANIZED 1891.

Hon. President—Dr. J. B. Harrington.
President—A. R. Archer, App. Sci., '01.
Vice-President—E. E. Palmer, App. Sci., '01.
Secretary-Treasurer—W. G. McBride, App. Sci., '02.

YOUNG MEN'S CHRISTIAN ASSOCIATION OF McGILL UNIVERSITY.

OBJECT.—To promote the piety of its members and the cause of Christianity in the University.

MEMBERSHIP.—The active Membership of the Association consists of Graduates and Students of the University who are members of some Evangelical church. Any Graduate and Student of good moral character may become an associate member. A social reception is given to new students at the beginning of the session.

Full particulars regarding regular religious services and Bible Study Classes are given in the Hand Book of the Association.

President—C. S. Paterson, Sc., '01.
1st Vice-President—W. G. Macnaughton, Arts, '01.
2nd Vice-President—A. L. Kendall, Med., '01.
Recording Secretary—H. Carson, Arts, '02.
Treasurer—W. H. DeBlois, Sc., '01.
Asst.-Treasurer—A. W. Park, Med., '03.
Representative from Law—Chas. Cotton, B.A., Law, '02.
General Secretary—George Irving, 'Arts, '02.

CHAIRMEN OF COMMITTEES.

Religious Meetings—A. L. Kendall, Med., '01.
Bible Study—W. G. Brown, B.A.
Social—R. C. Paterson, B.A.
Membership—W. G. Macnaughton, Arts, '01.
New Students and Handbook—General Secretary.
Bulletin and Reading Room—P. Cole, Sc., '03.
Missionary—E. C. Woodley, Arts, '00.
Musical—H. M. Lloyd, Sc., '01.
Building—C. S. Paterson.
Graduates—W. F. Hamilton, M.D.

YOUNG WOMEN'S CHRISTIAN ASSOCIATION.

ESTABLISHED 1887 (AS THEO DORA SOCIETY).

OBJECT.—The development of Christian character in the members, and the development of active Christian work, particularly among the young women of the University. Open for membership to students of the Royal Victoria College for Women.

President—Winifred Bennet.
Vice-President—Elizabeth Irving.
Cor.-Secretary—Harriet Page.
Rec.-Secretary—Margaret Hadrill.
Treasurer—Florence Woodley.

CONVENERS OF COMMTITEES.

Devotional—Harriet Page.
Theo Dora—Jessie McLachlan.
Membership—Evelyn Molson.
Relief—Mary Flint.

McGILL UNIVERSITY ATHLETIC ASSOCIATION.

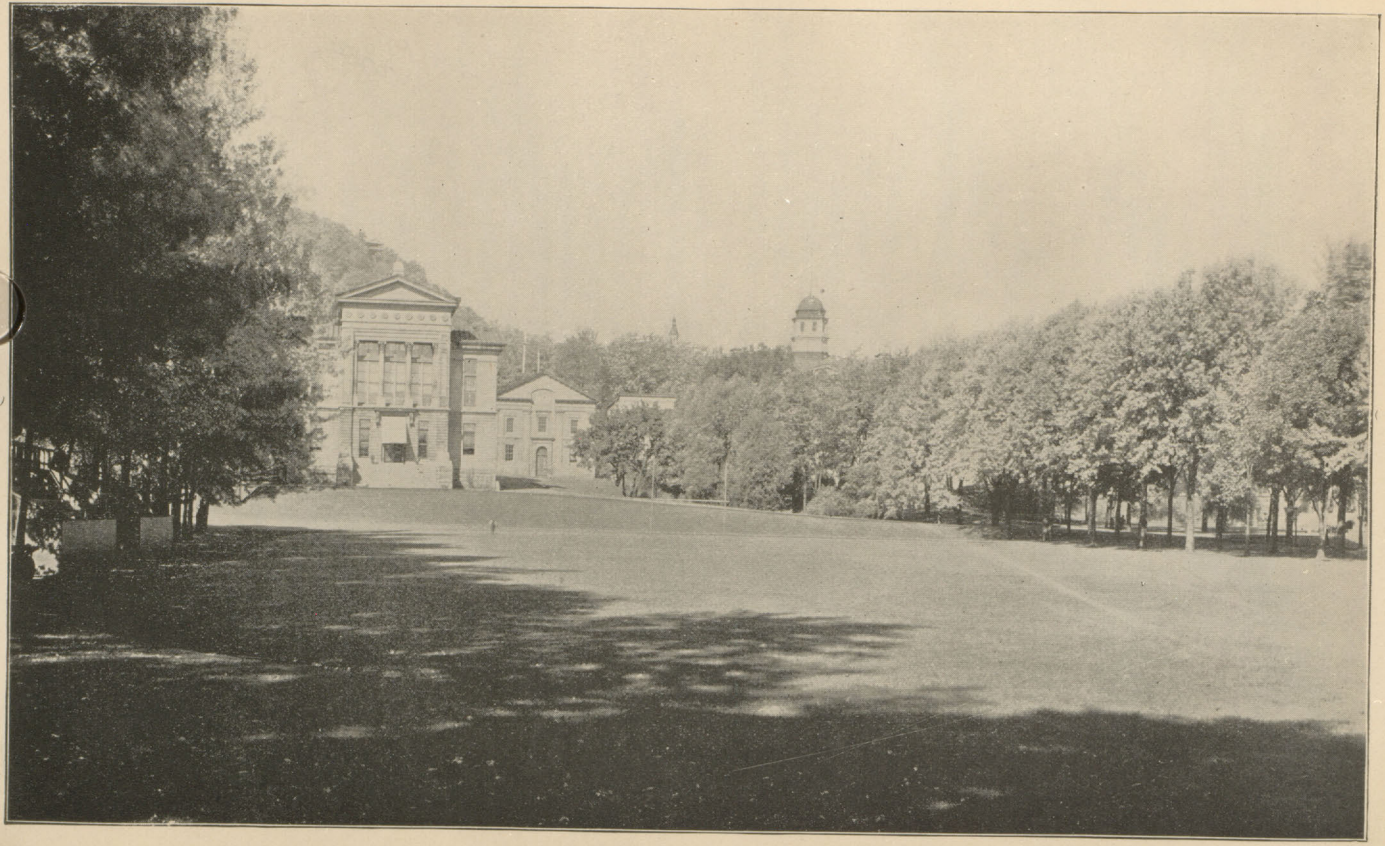
ESTABLISHED 1884.

Hon. President—Principal Peterson.
Hon. Treasurer—Wm. Osler, M.D.
President—J. H. Boulter, Arts, '01; Med., '03.
Vice-President—F. J. Tees, Arts, '01.
Treasurer—P. W. K. Robertson, App. Sc., '00.
Secretary—L. H. Redon, Med. '01.

McGILL UNIVERSITY FOOTBALL CLUB.

Hon. President—Mr. C. J. Fleet.
Hon. Treasurer—Prof. C. H. McLeod.
President—A. C. P. Howard, B.A., Med., '01.
Vice-President—G. R. Johnson, B.A., Med., '02.
Hon. Secretary.—F. S. Patch, B.A., Med., '03.
Treasurer—J. A. Mowatt, Arts, '01.
Manager—E. G. Mason, Med. '02.

Committee—Arts—P. Molson, '01; E. W. MacDougall, '03. Law—J. J. Meagher, '01; W. Leslie, '01. Medicine—W. L. Carter, '02; R. N. W. Shillington, '03. Science—E. G. Hampson, '01, G. M. Savage, '03.



Part of Campus with Museum in background.

UNIVERSITY LIBRARY

McGLL UNIVERSITY CRICKET CLUB.

Hon. President—Lord Strathcona and Mount Royal.
President—Prof. C. E. Moyse.
Vice-President—A. R. Oughtred, B.C.L.
Secretary-Treasurer—Herbert M. Little, B.A., Med., '01.
Assist. Secretary—Hugh W. Wonham.
Captain—H. Cyril Hill.
Committee—A. B. Wood, B.A.; E. H. McLea, B.Sc.; W. W. Walker; E. E. Macdonald, Med., '01; P. Molson, Arts, '01.

McGILL UNISERSITY LAWN TENNIS CLUB.

President—J. Arthur Fairie, Med., '01.
Vice-President—L. Macfarlane, Law, '00.
Secretary—J. K. Kennedy, B.C.L.
Treasurer—E. A. Grafton, M.D.
Committee—Arts—R. N. Hickson, '01; Law—J. J. Meagher,, '01; Medicine—J. L. Todd, '00; App. Science—J. E. K. Osborne, '00.

McGILL UNIVERSITY SKATING CLUB.

President—R. N. Hickson, Arts, '01.
Vice-President—A. H. Maclaren, Med., '02.
Secretary—A. P. S. Glassco, Sc., '01.
Treasurer—W. H. Duff, Law, '01.
Committee—Law—S. G. Archibald; Medicine—C. K. Russell, A. C. Ames; Arts—J. H. Copeman, H. Brown; Science—G. P. Cole, M. Barclay.

McGILL HOCKEY CLUB.

Hon. President—Prof. S. H. Capper.
President—C. Cartwright, '00.
Vice-President—W. Ness, '02.
Secretary-Treasurer—C. G. Mackinnon, '00.
Committee—Law—H. Trihey, '00; H. Springle, '01. Science—H. St. George, '00; H. Yuile, '03. Arts—P. Molson, '01; C. Moffat, '01. Medicine—E. R. Belanger, '02; A. Mussen, '00.

BENEFACTORS OF

McGill University, Montreal

I. GENERAL ENDOWMENTS AND SUBSCRIPTIONS.

I. ORIGINAL ENDOWMENT, 1811.

THE HONORABLE JAMES McGILL, who was born at Glasgow, 6th Oct., 1744, and died at Montreal, 19th Dec., 1813, by his last will and testament, under date 8th January, 1811, devised the estate of Burnside, situated near the city of Montreal, and containing forty-seven acres of land, with the Manor House and Buildings thereon erected, and also bequeathed the sum of ten thousand pounds in money unto the "Royal Institution for the Advancement of Learning," a Corporation constituted in virtue of an Act of Parliament passed in the Forty-first Year of the Reign of His Majesty, King George the Third, to erect and establish a University or College, for the purpose of Education and the advancement of learning, in the Province of Lower Canada, with a competent number of professors and teachers to render such Establishment effectual and beneficial for the purposes intended; requiring that one of the colleges to be comprised in the said University should be named and perpetually be known and distinguished by the appellation of "McGill College."

The value of the above mentioned property was estimated at the date of the bequest at.... ..... $120,000

2. UNIVERSITY BUILDINGS, ETC.

THE WILLIAM MOLSON HALL, being the west wing of McGill College buildings, with the connecting Corridors and Class Rooms, was erected in 1861, through the munificent donation of the founder, whose name it bears.

THE PETER REDPATH MUSEUM, the gift of the donor, whose name it bears, was announced by him as a donation to the University in 1880, and formally opened August, 1882.

Lots for University buildings adjoining the College grounds confronting on McTavish St., presented by J. H. R. Molson, Esq.,—$42,500.

THE UNIVERSITY LIBRARY BUILDING, the gift of Peter Redpath, Esq., announced by him as a gift to the University in 1891, and formally opened October 31st, 1893.

UNIVERSITY OFFICES, Rooms in East Wing remodelled and furnished for offices of Principal and Secretary and for a Board Room, by Sir Wm. C. Macdonald, in 1895.

3. ENDOWED CHAIRS, ETC.

THE JOHN FROTHINGHAM PRINCIPAL FUND, to be invested for the endowment of the Principalship of the University; founded in 1889 by the Rev. Frederick Frothingham and Mrs. J. H. R. Molson,—$40,000.

THE MACDONALD AUXILIARY FUND, founded in 1897 by Sir Wm. C. Macdonald, the interest to be used solely to maintain the income of certain of his endowments on a five per cent. per annum basis,—$328,750.

4. ENDOWMENTS AND DONATIONS OF MEDALS AND PRIZES.

1883, a Gold, a Silver and a Bronze Medal were given by R. J. Wicksteed, Esq., M.A., LL.D., for competition in "Physical Culture," by Students in the Graduating Class and second year of any Faculty, who have attended the University Gymnasium. The Gold Medal was continued to 1889 and the Silver and Bronze have been continued to date.

Ottawa Valley Graduates' Society's Exhibition. For competition by candidates from the Ottawa Valley at the June matriculation examinations of any Faculty. Value, $50.00. Given annually since 1895.

A Prize given by the British Columbia Society of Graduates of McGill University to be divided amongst the five Faculties. Annual value $50.00. Given annually since 1896.

5. SUBSCRIPTIONS TO GENERAL ENDOWMENT.

1856.

John Frothingham, Esq	$2000
John Torrance, Esq	2000
James B. Greenshields, Esq	1200
Wm. Busby Lambe, Esq	1200
Sir George Simpson, Knight	1000
Henry Thomas, Esq	1000
John Redpath, Esq	1000
James McDougall, Esq	1000
James Torrance, Esq	1000
Hon. James Ferrier	1000
Harrison Stephens, Esq	800
Henry Chapman, Esq	600
Hon. Peter McGill	600
John James Day, Esq	600
Thomas Brown Anderson, Esq	600
Peter Redpath, Esq	600
Thomas M. Taylor, Esq	600
Joseph Mackay, Esq	600
Donald Lorn McDougall, Esq	600
Hon. Sir John Rose	600
Charles Alexander, Esq	600
Forward	$19,200

Forward	$19,200
Moses E. David, Esq	600
Wm. Carter, Esq	600
Thomas Patton, Esq	600
Wm. Workman, Esq	600
Hon. Luther H. Holton	600
Henry Lyman, Esq	600
David Torrance, Esq	600
Edwin Atwater, Esq	600
Theodore Hart, Esq	600
Wm. Forsyth Grant, Esq	600
Robert Campbell, Esq	600
Alfred Savage, Esq	600
James Ferrier, jun., Esq	600
Wm. Stephen, Esq	600
N. S. Whitney, Esq	600
William Dow, Esq	600
William Watson, Esq	600
Edward and Alicia Major	600
Hon. Sir A. T. Galt	360
John R. Esdaile, Esq	200
Total	$30,560

1871.

John Frothingham, Esq	$5150
William Molson, Esq	5000
Sir William C. Macdonald	5000
Thomas Workman, Esq	5000
J. H. R. Molson, Esq	2000
John McLennan, Esq	1000
B. Gibb, Esq	600
Messrs. A. & W. Robertson	600
Forward	$24,350

Forward	$24,350
T. W. Ritchie, Esq	300
Messrs. Sinclair, Jack & Co	250
John Reddy, M.D	100
Wm. Lunn, Esq	100
Hon. F. W. Torrance	60
Wm. Rose, Esq	50
Total	$25,210

1881-82.

Hugh McLennan, Esq	$5000
Hon. G. A. Drummond	4000
George Hague, Esq	3000
M. H. Gault, Esq	2000
Andrew Robertson, Esq	1000
Robertson Campbell, Esq	1000
Sir Jos. and Lady Hickson	1000
Mrs. Andrew Dow	1000
Alexander Murray, Esq	1000
Miss Orkney	1000
Hector McKenzie, Esq	1000
Forward	$21,000

Forward	$21,000
O. S. Wood, Esq	1000
J.B. Greenshields, Esq. (London)	1000
Warden King, Esq	1000
W. P. Cumming, Esq	1000
Mrs. Hew Ramsay	500
R. A. Ramsay, Esq	500
H. H. Wood, Esq	500
James Burnett, Esq	500
Charles Gibb, Esq	500
J. S. McLachlan, Esq	200
Total	$27,700

1883-84

Edward Mackay, Esq $5,000

6. ENDOWMENT FUND FOR GENERAL PURPOSES.

1897.

Bequest of the late John H. R. Molson, Esq., $100,000.

7. SUBSCRIPTION FOR IMPROVEMENTS TO COLLEGE, 1856.

Hon. Charles Dewey Day ..... $200.

8. SUBSCRIPTION FOR CURRENT EXPENSES, 1881-82.

Principal Dawson					$1000
J. H. R Molson	1000	per annum,	5 years,	being	5000
Lord Mountstephen	1000	"	"	"	5000
Lord Strathcona and Mount Royal	1000	"	"	"	5000
David Morrice, Esq	200	"	"	"	1000
Messrs. Gault Brothers & Co	200	"	"	"	1000
Messrs. S. H. & A. S. Ewing	200	"	"	"	1000
Hon. Robert MacKay	300	"	2	"	600
Jonathan Hodgson, Esq	100	"	5	"	500
Geo. M. Kinghorn, Esq	100	"	"	"	500
David . Greenshields, Esq					300
Thomas Craig, Esq	100	"	2	"	200
John Rankin, Esq					200
John Duncan, Esq					200
George Brush, Esq., $25 for five years, being					125
Robert Benny, Esq					100
Miss E. A. Ramsay					100
Hugh Paton, Esq., $50 for two years, being					100
J. M. Douglas, Esq					50
James Court, Esq					50
Total					$22,025

1887-88.

John H. R. Molson, Esq	$1000	per annum,	3 years,	being	$3000
Sir Wm. C. Macdonald	1000	"	"	"	3000
Peter Redpath, Esq	1000	"	"	"	3000
Lord Strathcona and Mount Royal	1000	"	"	"	3000
Hon. James Ferrier	500	"	"	"	1500
Sir Joseph Hickson	500	"	"	"	1500
Hugh McLennan, Esq	250	"	"	"	750
E. B. Greenshields, Esq	250	"	"	"	750
George Hague, Esq	250	"	"	"	750
John Molson, Esq	250	"	"	"	750
Samuel Finley, Esq	250	"	"	"	750
Mrs. Mackay, $100 annually, 1889 to 1893					500
Total					$19,250

9. SUBSCRIPTION BY MEMBERS OF BOARD OF GOVERNORS, IN 1898-99.—$191,000.

10. SUBSCRIPTIONS FOR A BUILDING FOR THE CARPENTER COLLECTION OF SHELLS.

1868.

Peter Redpath, Esq.	$ 500
William Molson, Esq.	500
Harrison Stephens, Esq	100
Robert J. Reekie, Esq	100
John H. R. Molson, Esq	100
Sir Wm. E. Logan, F.R.S	100
John Molson, Esq	100
Thos. Workman, Esq., M.P	100
Forward	$ 1,600

Forward	$ 1,600
Geo. H. Frothingham, Esq	100
Wm Dow, Esq	100
Thomas Rimmer, Esq	100
Andrew Robertson, Esq	100
Mrs. Redpath	100
Benaiah Gibb, Esq.	50
Hon. John Rose	50
Total	$ 2,200

11. SUBSCRIPTIONS FOR THE ERECTION OF THE LODGE AND GATES.

William Molson, Esq	$ 100
John H. R. Molson, Esq	100
William Workman, Esq	100
Joseph Tiffin, jun., Esq	100
Thos. J. Claxton, Esq	100
James Linton, Esq	100
William McDougall, Esq	100
Charles J. Brydges, Esq	100
Hon. George A. Drummond	100
Thomas Rimmer, Esq	100
William Dow, Esq	100
Total	$ 1,100

Forward	$ 1,100
John Frothingham, Esq	100
James A. Mathewson, Esq	100
Peter Redpath, Esq	100
G. H. Frothingham, Esq	100
G. D. Ferrier, Esq	100
John Smith, Esq	100
Charles Alexander, Esq	100
J. Evans, Esq	100
Henry Lyman, Esq	50
Total	$ 1,950

12. LIBRARY AND MUSEUM.

Special Collections of Books presented to the Library.

1. The Peter Redpath Collection of Historical Books, presented by Peter Redpath, Esq., of Montreal, 3,500 Volumes, with subsequent additions.
2. The Robson Collection of works in Archæology and General Literature, presented by Dr. John Robson, of Warrington, England, 3,436 Volumes.
3. The Charles Alexander Collection of Classical Works, presented by C Alexander, Esq., of Montreal, 221 Volumes.
4. Frederick Griffin, Esq., Q. C., Collection of Books, being the whole of his Library, bequeathed by his will, 2,695 Volumes.
5. The Hon Mr. Justice Mackay, Collection of Books, being the whole of his Library, 2,007 Volumes.
6. The "T. D. King Shakespeare Collection," presented by the Lord Strathcona and Mount Royal and Sir W. C. Macdonald, of Montreal, being 214 Volumes.
7. The Ribbeck Library of Classical Literature, presented by Sir W. C. Macdonald, about 4,000 works.
8. The "Mendelssohn Choir Memorial Collection," presented by Joseph Gould, Esq., 200 volumes.
9. The "John Horne" Collection of Canadian Portraits and Autographs, 177 in all.

Endowments for Library.

Wm. Molson, Esq., for Endowment of a Library Fund (1871)..	$ 4,000
Hon. F. W. Torrance for Endowment of Mental, Moral and Political Philosophy Book Fund (1876)..	1,000
Mrs. Redpath, for the Endowment of the Wm. Wood Redpath Memorial Fund (1881)....	1,000
Forward	$ 6,000
Forward	$ 6,000
A friend, by the Hon. F. W. Torrance, for Endowment of a Library Fund (1882)	400
Hugh S. McLennan, Library Endowment, a gift from Estate late Hugh S. McLennan to the Library of McGill College, the income to be applied to binding (1892)	250
Total	$ 6,650

Subscriptions, etc., to Library.

John Thorburn for purchase of Books	$ 90
Andrew Drummond, do., for Applied Science	25
The Graduates in Arts and Applied Science of 1885 for purchase of Books	31
do do of 1886	28
The late R. A. Ramsay, Esq., Bequest for purchase of books (1887)	1,000
Andrew Drummond, Esq., to Library Fund of Faculty of Applied Science	25
Lord Strathcona and Mount Royal, for purchase of books from the R. W. Boodle Library	200
Ottawa Valley Graduates' Society, for binding books in the University Library	25
Forward	$ 1,424
Forward	$ 1,424
Peter Redpath, Esq., in aid of the new catalogue of the Library (1892)	500
Mrs. Peter Redpath for maintenance of Library, $5,000 per annum since 1894	30,000
Lord Strathcona and Mount Royal, donation for the purchase of books for the Library, particularly in the French Department (1897)	250
John H. R. Molson, donation for purchase of books for the Library (1897)	195
Hon. Treas. Redpath Memorial Fund, London, England. The balance remaining over of the above fund to be used for purchase of books for the Library	47
Total	$27,416

Special Collections presented to the Museum.

1. The Holmes Herbarium, presented by the late Andrew F. Holmes, M.D.
2. The Carpenter Collection of Shells, presented by the late P. P. Carpenter, Ph.D.
3. The Collection of Casts of Ivory Carvings, issued by the Arundel Society, presented by Henry Chapman, Esq.
4. The McCulloch Collection of Birds and Mammals, collected by the late Dr. M. McCulloch, of Montreal, and presented by his heirs.
5. The Logan Memorial Collections of Specimens in Geology and Natural History, presented by the heirs of the late Sir W. E. Logan, LL.D., F.R.S.
6. The Dawson Collection in Geology and Palæontology, being the Private Collections of Principal Dawson, presented by him to the Museum.
7. The Bowles Collection of Lepidoptera, presented by Sir Wm. C. Macdonald, and J. H. Burland, Esq.
8. R. Morton Middleton, jr., London, Eng., Collection of Plants.
9. Collection of Butterflies, presented by the Members of the Board of Governors of the University.

10. Collection of Lepidoptera, presented by Sir W. C. Macdonald.
(See also "List of Donations to the Library and Museum," printed in the Annual Report of the University and Report of the Museum.)

Endowment for the Museum.

Wm. Molson, Esq., for the Endowment of a Museum Fund (1873).....$ 2,000

Subscriptions, etc., for the Museum.

T. J. Claxton, Esq., for purchase of Specimens for Museum ... .$	250
Peter Redpath, Esq., for Museum expenses, $1,000 per annum from 1882 to 1893	12,000
Mrs. Peter Redpath, for Museum expenses, 1894 to 1899	8,500
Mrs. H. G. Frothingham for the arrangement of Dr. Carpenter's Collection of Mazatlan shells..	233
Peter Redpath, Esq., for improvements to Museum (1891)	1,000
Forward .....$	21,983

Forward .....$	21,983
A Lady, for Museum expenses from 1882 to 1894	7,000
A Friend for the purchase of Specimens for the Museum....	4,300
John H. R. Molson, for purchase of books on "Butterflies of Eastern U. S. and Canada"	50
Lord Strathcona and Mount Royal, for mounting skin and skeleton of Musk Ox.....	150
Total.....$	33,483

13. MISCELLANEOUS.

Chas. T. Blackman, Esq., of Montreal, the gift of a Telescope and Astronomical Instruments called after his name.
J. J. Arnton bequest to McGill University (1895).....$ 900
R. A. Ramsay, M. A., B. C. L., to defray the expenses of re-erecting the tomb of the late Hon. James McGill (1877)..... 150
Sir Wm. C. Macdonald, contribution to cover cost of illustrating calendar... 586 66

14. UNIVERSITY PORTRAITS AND BUSTS.

Portrait of the Founder, presented by the late Thomas Blackwood, Esq.
Portrait of William Molson, Esq., presented to the University.
Bust of William Molson, Esq., by Marshall Wood, presented by Graduates of the University.
Portrait of Peter Redpath, Esq., painted by Sydney Hodges, presented by Citizens of Montreal.
Portrait of Rev. Dr. Leach, by Wyatt Eaton, presented by Friends and Graduates of the University.
Portrait of Sir William Dawson, by Wyatt Eaton, presented by Friends and Graduates of the University.
Portrait of Hon. James Ferrier, by Robert Harris, presented by Friends and Graduates of the University.
Portrait of Peter McGill, presented (through Mr. A. T. Taylor), by Judge Parker, of Edinburgh.
Portrait of Dr. William Robertson, founder of the Medical Faculty, presented in loving remembrance by his family and descendants.
Bust of Peter Redpath, Esq., by Reynolds Stephens, presented by Mr. Redpath's personal friends in England.
Portrait of Peter Redpath, Esq., by Robert Harris, presented by Friends and Undergraduates of the University.
Portrait of Mrs. Peter Redpath, by Robert Harris, presented by the Governors of the University
Portrait of John H. R. Molson, by Robert Harris, presented by the Governors of the University.

II. ENDOWMENTS AND SUBSCRIPTIONS FOR THE FACULTY OF ARTS.

1. BUILDINGS, CHAIRS, ETC.

Endowment Fund, 1856.

John Gordon McKenzie, Esq. $2,000
Ira Gould, Esq. ..... 2,300—Total, $4,300

THE MOLSON CHAIR OF ENGLISH LANGUAGE AND LITERATURE, in 1856, endowed by the Honorable John Molson, Thomas Molson, Esq., and William Molson, Esq.—$20,000; and supplemented in 1892 by John H. R. Molson, Esq., with a further sum of $20,000. Total, $40,000.

THE PETER REDPATH CHAIR OF PURE MATHEMATICS (founded as Chair of Natural Philosophy), in 1871, endowed by Peter Redpath, Esq., $20,000.

THE LOGAN CHAIR OF GEOLOGY, in 1871, endowed by Sir W. E. Logan, LL.D., F.R.S., and Hart Logan, Esq.—$20,000.

THE JOHN FROTHINGHAM CHAIR OF MENTAL AND MORAL PHILOSOPHY, 1873, endowed by Miss Louisa Frothingham,—$20,000, and supplemented in 1891 with a further sum of $20,000. Total $40,000.

THE MAJOR HIRAM MILLS CHAIR OF CLASSICS, in 1882, endowed by the last will of the late Major Hiram Mills of Montreal,—$42,000.

THE DAVID J. GREENSHIELDS CHAIR OF CHEMISTRY AND MINERALOGY in the Faculties of Arts and Applied Science, in 1883, endowed by the last will of the late David J. Greenshields, Esq., of Montreal, with the sum of $40,000, half of which is devoted to the Faculty of Arts.

THE MACDONALD CHAIRS OF PHYSICS, in the Faculties of Arts and Applied Science, endowed by Sir William C. Macdonald, in 1890,—$50,000; in 1893,—$50,000. Total, $100,000.

THE CHARLES GIBB BOTANICAL ENDOWMENT, subscriptions received to date:

A Friend. $8,000
Mrs. Catherine Hill ..... 200—Total, $8,200

THE MACDONALD Physics Building and Equipment, in the Faculties of Arts and Applied Science. The gift of Sir William C. Macdonald, announced, by him as a gift to the University in 1890, and formally opened February, 1893.

THE MACDONALD PHYSICS BUILDING Maintenance Fund in the Faculties of Arts and Applied Science, endowed by Sir William C. Macdonald,—$150,000.

THE MACDONALD CHEMISTRY AND MINING BUILDING AND EQUIPMENT, endowed by Sir William C. Macdonald, $226,821.25.

THE MACDONALD CHEMISTRY AND MINING BUILDING MAINTENANCE FUND, endowed by Sir William C. Macdonald, $225,000.

The MACDONALD CHEMISTRY ENDOWMENT FUND, endowed by Sir William C. Macdonald, $135,000.

THE KINGSFORD CHAIR OF HISTORY, endowed by Sir Wm. C. Macdonald, in 1898, $50,000.

THE DAWSON CHAIR OF GEOLOGY endowed by Sir Wm. C. Macdonald in 1899, $50,000.

The MACDONALD BUILDINGS REPAIR FUND, endowed in 1900 by Sir William C. Macdonald, $15,000.

2. ENDOWMENT FOR PENSION FUND.

This endowment was given in 1894 to be invested and the revenue used exclusively for providing Pensions or Retiring Allowances for members of the teaching staff of the Faculties of Arts and Applied Science.

Lord Strathcona and Mount Royal..$50,000
John H. R. Molson 50,000
Sir William C. Macdonald ..... 50,000—Total, $150,000

3. EXHIBITIONS AND SCHOLARSHIPS, ETC.

THE JANE REDPATH EXHIBITION, in the Faculty of Arts,—founded in 1868, by Mrs. Redpath, of Terrace Bank, Montreal, and endowed with the sum of $1,667.

THE MACDONALD SCHOLARSHIPS AND EXHIBITIONS, 10 in number, in the Faculty of Arts—founded in 1871, and endowed in 1882 with the sum of $25,000 by Sir William C. Macdonald.

THE CHARLES ALEXANDER SCHOLARSHIP, for Classics—founded in 1871 by Charles Alexander, Esq. Endowed in 1893 with the sum of $2,000.

THE BARBARA SCOTT SCHOLARSHIP FOR CLASSICAL LANGUAGE AND LITERATURE—founded in 1884 by the last will of the late Miss Barbara Scott, of Montreal, in the sum of $2,000.

THE GEORGE HAGUE EXHIBITION—founded in 1881—Annual value $125.

THE MAJOR HIRAM MILLS MEDAL AND SCHOLARSHIP—founded by the will of the late Major Hiram Mills, of Montreal, and endowed with the sum of $1,500.

T. M. THOMPSON, ESQ.—$250 for two Exhibitions in September, 1871; $200 for two Exhibitions in 1872,—$450.

REV. COLIN C. STUART—for the "Stuart Prize in Hebrew,"—$60.

THE TAYLOR SCHOLARSHIP—founded in 1871, by T. M. Taylor, Esq.—Annual value $100—terminated in 1878.

PROFESSOR ALEXANDER JOHNSON—for Scholarship for three Sessions, terminated 1886-87—$350.

HER MAJESTY'S COMMISSION for the Exhibition of 1851—Nomination Scholarships for 1891, 1893, 1895 and 1897, value £150 annually, tenable for two years.

THE PHILIP CARPENTER FELLOWSHIP—founded by Mrs. Philip Carpenter, for the Maintenance of a Post-Graduation Teaching Fellowship or Scholarship in Natural Science or some branch thereof in the Faculty of Arts in McGill College, endowed in 1892 with the sum of $7,000.

A Lady, to provide for three tuitions in the Faculty of Arts for sessions 1892-93 1893-94.

THE NEW YORK GRADUATE SOCIETY EXHIBITION—a gift of $60 annually since 1897, for an Exhibition in the Faculty of Arts to be associated with the name of Sir William Dawson.

To provide Bursaries in the Faculty of Arts, subscriptions from

W. W. Ogilvie	1898 and 1899	$ 2,000
Hugh McLennan	1898 and 1899	240
D. Macmaster	1898	120

4. ENDOWMENTS AND DONATIONS OF MEDALS AND PRIZES.

In 1856 Henry Chapman, Esq., founded a gold medal, to be named the "Henry Chapman Gold Medal," to be given annually in the graduating class in Arts. This medal was endowed by Mr. Chapman in 1874 with the sum of $700.

In 1860 the sum of £200, presented to the College by H. R. H. the Prince of Wales, was applied to the foundation of a Gold Medal, to be called the "Prince of Wales Gold Medal," which is given in the graduating class for Honour Studies in Mental and Moral Philosophy.

In 1864 the "Anne Molson Gold Medal" was founded and endowed by Mrs. John Molson, of Belmont Hall, Montreal, for an Honour Course in Mathematics and Physics.

In the same year the "Shakespeare Gold Medal," for an Honour Course, to comprise and include the works of Shakespeare and the Literature of England from his time to the time of Addison, both inclusive, and such other accessory subjects as the Corporation may from time to time appoint, was founded and endowed by citizens of Montreal, on occasion of the three hundredth anniversary of the birth of Shakespeare.

In the same year the "Logan Gold Medal" for an Honour Course in Geology and Natural Science was founded and endowed by Sir William Logan, LL.D., F.R.S., F.G.S., etc.

In 1874 a Gold and a Silver Medal were given by His Excellency the Earl of Dufferin, Governor-General of Canada, for competition in the Faculty of Arts, and continued till 1878.

In 1875 the "Neil Stuart prize in Hebrew" was endowed by Neil Stuart, Esq., of Vankleek Hill, in the sum of $340.

In 1880 a Gold and a Silver Medal were given by His Excellency the Marquis of Lorne, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science; continued till 1883.

In 1884 a Gold and a Silver Medal were given by His Excellency the Marquis of Lansdowne, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1888.

In 1889 a Gold and a Silver Medal were given by His Excellency Lord Stanley, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1893.

THE "CHARLES G. COSTER MEMORIAL PRIZE" for general proficiency—given annually by Colin H. Livingstone, Esq., B.A.; founded in 1889.

In 1894 a Gold and a Silver Medal were given by His Excellency the Earl of Aberdeen, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1898.

In 1899 a Gold and a Silver Medal were given by His Excellency the Earl of Minto, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued to date.

5. SUBSCRIPTIONS FOR THE SUPPORT OF THE CHAIR OF BOTANY, 1883-84.

Sir Wm. Dawson	$500	per annum,	for 5	years,	being	$2,500
Lord Strathcona and Mount Royal	250	"	"	"		1,250
J. H. R. Molson, Esq	100	"	"	"		500
Mrs. J. H. R. Molson	100	"	"	"		500
G. Hague, Esq	100	"	"	"		500
Mrs. Redpath	100	"	"	"		500
Hugh McKay, Esq	100	"	"	"		500
Robert Moat, Esq	100	"	"	"		500
Sir Wm. C. Macdonald	100	"	"	"		500
Charles Gibb, Esq	50	"	"	"		250
Miss Orkney	50	"	"	"		250
Robert Mackay, Esq	50	"	"	"		250
Mrs. Wm. Molson	50	"	"	"		250
Mrs. John Molson	50	"	"	"		250
John Stirling, Esq	50	"	"	"		250
Warden King, Esq	50	"	"	"		250
Miss Hall	50	"	"	"		250
Robert Angus, Esq	50	"	"	"		250
D. A. P. Watt, Esq	50	"	"	"		250
Hugh McLennan, Esq	25	"	"	"		125
Sir Joseph Hickson	10	"	"	"		50
Mrs. Phillips						20
						$9,945

6. BOTANIC GARDEN, ETC.

Subscriptions, 1890-91.

Hugh McLennan, Esq	$100	Forward	$900
Gilman Cheney, Esq	100	Jonathan Hodgson, Esq	100
James Johnston, Esq	100	Robert Mackay, Esq	100
James Slessor, Esq	100	H. Shorey, Esq	50
A friend	100	J. S. Shearer, Esq	50
Hugh Graham, Esq	100	Geo. Sumner, Esq	25
A. F. Gault, Esq	100	A. Ramsay & Co	25
W. T. Costigan, Esq	100	Garth & Co	25
Jonathan Brown, Esq	100		
Forward	$900	Total	$1,275

To Erect Plant House in Botanic Garden.

Lord Strathcona and Mount Royal	$362 00
John H. R. Molson, Esq	361 51
Sir William C. Macdonald	361 02
Total	$ 1,084 53

7. SUBSCRIPTIONS IN AID OF THE CHAIR OF HEBREW.

Warden King, Esq	in 1889	$50 per annum, 3 years being	$150
Sir William Dawson	"	50 " " "	150
Hon. Hugh Mackay	"	50 " " "	150
A. F. Gault, Esq.	"	25 " " "	75
Geo. Hague, Esq	"	25 " " "	75
T. A. Dawes, Esq	"	25 " " "	75
S. Carsley, Esq	"	25 " " "	75
S. Davis, Esq	in 1892		20
Warden King, Esq	"	50 per annum for 3 years	150
A. F. Gault, Esq	"	50 " " "	150
Robert Mackay, Esq	"	50 " " "	150
Hugh McLennan, Esq	"	25 " " "	75
George Hague, Esq.	"	25 " " "	75
T. A. Dawes, Esq	"	25 " " "	75
S. Carsley, Esq	"		25
J. Murphy, Esq	"		25
Total			$1,495

8. SUBSCRIPTIONS TO PROVIDE SESSIONAL LECTURERS, ETC.

Lord Strathcona and Mount Royal, sessions 1891-92 to 1898-99	$42,000
Mrs. John H. R. Molson, sessions 1891-92 to 1898-99	7,300
Sir Wm. C. Macdonald, to provide for certain salaries in the Department of Physics, etc., sessions 1894-95 and 1895-96	2,627
Total	$51,927

9. ENDOWMENTS FOR APPARATUS.

The Local Committee of the British Association for the Advancement of Science to found the British Association Apparatus Fund in the Faculties of Arts and Applied Science, in commemoration of the meeting of the Association in Montreal in 1884 ..... $1,500

10. SUBSCRIPTIONS, ETC., FOR APPARATUS.

Philosophical Apparatus, 1867.	
William Molson, Esq	$500
John H. R. Molson, Esq	500
Peter Redpath, Esq	500
George Moffatt, Esq	250
Andrew Robertson, Esq	100
John Frothingham, Esq	100
David Torrance, Esq	100
Thos. J. Barron, B A	50
J. H. R. Molson, Esq., Dynamo, Gas Engine and Fixtures	1,792
Mrs. Redpath, Storage battery	400
Forward	$4,292
Forward	$4,292
Sir Wm. C. Macdonald, fittings of Upper Chemical Laboratory	2,075
A. J. Lawson, a Dynamo	
Benjamin Dawson, 3 Microscopes	
Botanical Apparatus, 1897.	
Sir Wm. C. Macdonald	420
Hugh McLennan, Esq	111
Samuel Finley, Esq	111
A. F. Gault, Esq	111
Total	$ 7,120

11. MISCELLANEOUS.

Hugh McLennan, Esq., subscription toward expense of table at the Biological Station, Wood's Holl, Mass., for McGill Professor of Botany (1896 to 1899). $300

III. ROYAL VICTORIA COLLEGE.

1. THE DONALDA ENDOWMENT FOR THE HIGHER EDUCATION OF WOMEN.

This endowment, given by the Lord Strathcona and Mount Royal of Montreal, is to provide for the education of women in the subjects of the Faculty of Arts, up to the standard of the examination for B.A., in classes wholly separate, to constitute a separate Special Course or College for Women, in 1884, $50,000 and in 1886—$70,000..... .....Total. $120,000

2. MISCELLANEOUS SUBSCRIPTIONS.

Lord Strathcona and Mount Royal, for musical instruction in sessions 1889-90 and 1890-91..... .....$400

Lord Strathcona and Mount Royal, for appliances in Zoology in the special interest of Donalda classes in 1895..... .....$100

Lord Strathcona and Mount Royal, for maintenance of Royal Victoria College, session 1899-1900... .....$42,500

3. ENDOWMENT HELD IN TRUST BY THE BOARD OF ROYAL INSTITUTION.

The "Hannah Willard Lyman Memorial Fund," contributed by subscriptions of former pupils of Miss Lyman, and invested as a permanent endowment to furnish annually a Scholarship or Prizes in a "College for Women" affiliated to the University, or in classes for the Higher Education of Women, approved by the University. The amount of the fund is at present $1,100.

IV. ENDOWMENTS AND SUBSCRIPTIONS FOR THE FACULTY OF APPLIED SCIENCE

1. BUILDINGS, CHAIRS, ETC.

THE WILLIAM SCOTT CHAIR OF CIVIL ENGINEERING, in 1884, endowed by the last will of the late Miss Barbara Scott, of Montreal.—$30,000.

THE DAVID J. GREENSHIELDS CHAIR OF CHEMISTRY AND MINERALOGY, in the Faculties of Arts and Applied Science, in 1883, endowed by the last will of the late David J. Greenshields, Esq., of Montreal, with the sum of $40,000, half of which is devoted to the Faculty of Applied Science.

THE THOMAS WORKMAN DEPARTMENT OF MECHANICAL ENGINEERING—founded in 1891 under the last will of the late Thomas Workman, Esq., who bequeathed the sum of $117,000—$60,000 for the maintenance of a Chair of Mechanical Engineering, with the assistance, shops, machinery and apparatus necessary thereto, $57,000 to be expended in provision of necessary buildings, machinery and apparatus.

SIR WILLIAM C. MACDONALD, in 1890, towards erection of Thomas Workman Workshops, $20,000.

THE MACDONALD ENGINEERING BUILDING AND EQUIPMENT—announced by Sir Wm. C. Macdonald as a gift to the University in 1890, and formally opened February, 1893.

THE MACDONALD PHYSICS BUILDING AND EQUIPMENT in the Faculties of Arts and Applied Science, the gift of Sir William C. Macdonald, announced by him as a gift to the University in 1890, and formally opened February, 1893.

THE MACDONALD CHAIRS OF PHYSICS, in the Faculties of Arts and Applied Science, endowed by Sir William C. Macdonald, in 1890—$50,000, in 1893, $50,000. Total, $100,000.

THE MACDONALD CHAIR OF ELECTRICAL ENGINEERING endowed by Sir Wm. C. Macdonald, in 1891, with the sum of $40,000; in 1898, with the additional sum of $10,000.

THE MACDONALD ENGINEERING BUILDING MAINTENANCE FUND, endowed by Sir Wm. C. Macdonald, in 1892 and 1896.—$85,000.

THE MACDONALD PHYSICS BUILDING MAINTENANCE FUND in the Faculties of Arts and Applied Science, endowed by Sir Wm. C. Macdonald, in 1892 and 1896—$150,000.

THE MACDONALD CHEMISTRY AND MINING BUILDING AND EQUIPMENT, given to the University by Sir Wm. C. Macdonald, in 1896.—$266,821.25.

THE MACDONALD CHEMISTRY AND MINING BUILDING MAINTENANCE FUND, endowed by Sir William C. Macdonald, $225,000.

THE MACDONALD CHAIR OF MINING AND METALLURGY, endowed in 1896 by Sir William C. Macdonald, with the sum of $50,000.

THE MACDONALD CHAIR OF ARCHITECTURE, endowed in 1896 by Sir Wm. C. Macdonald, with the sum of $50,000.

THE MACDONALD CHAIR OF CHEMISTRY, endowed in 1897 by Sir William C. Macdonald, with the sum of $50,000.

THE MACDONALD ARCHITECTURAL DEPARTMENT MAINTENANCE FUND, endowed by Sir William C. Macdonald, in 1898.—$10,000.

THE SIR WILLIAM C. MACDONALD ENDOWMENT DEPARTMENT OF MINING AND METALLURGY, 1899.—$55,000.

THE SIR WILLIAM C. MACDONALD ENDOWMENT OF DEPARTMENT OF CHEMISTRY, 1900.—$135,000.

THE MACDONALD BUILDINGS REPAIR FUND, endowed in 1900 by Sir William C. Macdonald.—$15,000.

2. ENDOWMENT FOR PENSION FUND.

This endowment was given in 1894 to be invested and the revenue used exclusively for providing Pensions or Retiring Allowances for members of the teaching staff of the Faculties of Arts and Applied Science:

Lord Strathcona and Mount Royal...$50,000
John H. R. Molson, Esq..... 50,000
Sir Wm. C. Macdonald..... 50,000—Total, $150,000

3. EXHIBITIONS AND SCHOLARSHIPS.

THE SCOTT EXHIBITION.—Founded by the Caledonian Society of Montreal, in commemoration of the Centenary of Sir Walter Scott, and endowed in 1872 with the sum of $1,100 subscribed by members of the Society and other citizens of Montreal The Exhibition is given annually in the Faculty of Applied Science—Annual value $50.

THE BURLAND SCHOLARSHIP, founded 1882 by J. H. Burland, B.A.Sc., $100 for a Scholarship in Applied Science for three years, being $300.

HER MAJESTYS' COMMISSION for the Exhibition of 1851—Nomination Scholarships for 1891, 1893, 1895 and 1897, value £150 annually, each tenable for two years.

THE DR. T. STEIRY HUNT SCHOLARSHIP.—Founded in 1894 by the will of the late Dr. T. Sterry Hunt, and endowed with the sum of $2,082, the income to be given and paid annually to a student or students of Chemistry.

4. MEDALS AND PRIZES.

In 1880 a Gold and a Silver Medal were given by His Excellency the Marquis of Lorne, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1883.

In 1884 a Gold and a Silver Medal were given by His Excellency the Marquis of Lansdowne, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1888.

In 1885 the British Association Gold Medal for competition in the Graduating class in the Faculty of Applied Science, was founded by subscription of members of the British Association for the Advancement of Science, and by gift of the Council of the Association, in commemoration of its meeting in Montreal in the year 1884.

In 1889 a Gold and a Silver Medal were given by His Excellency Lord Stanley, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1893.

In 1894 a Gold and a Silver Medal were given by His Excellency the Earl of Aberdeen, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued till 1898.

In 1899 a Gold and a Silver Medal were given by His Excellency the Earl of Minto, Governor-General of Canada, the former for competition in the Faculty of Arts, the latter for competition in the Faculty of Applied Science. Continued to date.

5. ENDOWMENTS AND SUBSCRIPTIONS FOR MAINTENANCE OF FACULTY.

Endowment Fund.

Daniel Torrance, Esq	$5,000
Charles J. Brydges, Esq	1,000
R. J. Reekie, Esq	100
Total	$6,100

Graduates' Endowment Fund.

Graduates' Endowment Fund—Class 1890, $70 a year for 5 years, $350; received to date..	$85

Annual Subscriptions, 1871-1879

Hon. James Ferrier ($100 per annum for 10 years)	$1,000
Peter Redpath, Esq. ($400 per annum for 10 years)	4,000
John H. R. Molson, Esq. ($400 per annum for 10 years)	4,000
George H. Frothingham, Esq. ($400 per annum for 7 years)...	2,800
T. James Claxton, Esq. ($100 per annum for 6 years)	600
Donald Ross, Esq. ($50 per annum for 5 years)	250
Miss Mary Frothingham ($400 per annum for 3 years)	1,200
Forward	$13,850

Forward	$13,850
H. McLennan, Esq. ($100 per annum for 5 years)	500
A. F. Gault, Esq. ($100 per annum for 5 years)	500
Gilbert Scott, Esq. ($100 for 2 years)	200
Joseph Hickson, Esq. ($100 for 2 years	200
Sir Wm. Dawson ($300 for 2 years)	600
His Excellency the Marquis of Lorne	500
Mrs. Redpath (Terrace Bank)...	100
Total.	$16,450

Subscriptions towards Maintenance of Engineering Department.

Sir Wm. C. Macdonald, sessions 1891-92 to 1897-98		$56,341
do	for advertising	675
do	to cover certain salaries, session 1894-95 and 1897-98..	1,920
do	to meet the expenses of the course of summer work for Mining Engineering Students (1898).	825
do	Electric Light Re-installation in Engineering Building, 1899	6,000
do	to cover salary of Assistant in Chemical Department, session 1898-99 and session 1899-1900	1,000
Total		$66,761

Subscriptions to provide lectures in Mechanical and Sanitary Engineering.

E. B. Greenshields, Esq	$50
J. E. Bovey, Esq	50
Professor H. T. Bovey	61
Total	$161

Forward	$161
Jeffrey H. Burland, B.A.Sc., $100 for 2 years	200
Smaller amounts	40
Total	$401

Subscriptions for Maintenance of Chair of Practical Chemistry, 1862.

Hon. C. Dunkin, M.P	$1,200
Sir William Dawson	1,200
Peter Redpath, Esq	226
Total	$2,626

For Maintenance of Chair of Mining Engineering and Metallurgy, 1891.

R. B. Angus, Esq	$2000	
Mrs. Dow	1000	
Hugh McLennan, Esq	1000	
Miss Benny	1000	
T. A. Dawes, Esq	750	
A. A. Ayer, Esq	250	
G. W. Reid, Esq	100	
Evans Bros	100	
		$6,200
Payable in Three Years.		
Sir Wm. Dawson	1000	
Alex. Stuart, Esq. (London, Eng)	1500	
R. G. Reid, Esq	1500	
Forward	$4,000	$6,200
Forward	$4,000	$6,200
E. K. Greene, Esq	750	
Dr. T. Brainerd	750	
A. F. Gault, Esq	750	
Messrs. H. & A. Allan	750	
Hector Mackenzie, Esq	750	
Peter Lyall, Esq	750	
James Ross, Esq	600	
A. Robertson, Esq	300	
John Duncan, Esq	300	
George Hague, Esq	300	
Jonathan Hodgson, Esq	300	
James Moore, Esq	200	
Messrs. Ames & Holden	150	
James Cooper, Esq	150	
		10,800
Total		$17,000

Remodelling East Wing for Class Rooms for Faculty of Applied Science, 1888.

John H. R. Molson, Esq	$3000	Total	$6,000
Sir Wm. C. Macdonald	3000		

6. ENDOWMENTS FOR APPARATUS.

The Local Committee of the British Association for the Advancement of Science, to found the British Association Apparatus Fund in the Faculties of Arts and Applied Science, in commemoration of the meeting of the Association in Montreal in 1884 $1,500

7. SUBSCBIPTIONS, ETC., FOR APPARATUS.

A lady, for the purchase of Mining Models	$1000	Forward	$1,175
Thos. McDougall, Esq., for the same	25	for the purchase of Appliances for the department of Civil Engineering in Faculty of Applied Science	475
J. Livesey, Esq., through Dr. Harrington, for the same	50	Capt. Adams, Chemical Apparatus	10
Geo. Stephen, Esq., for the same	50	J. H. Burland, B.A.Sc., Chemical Apparatus	25
Chas. Gibb, B.A., donation for Apparatus in Applied Science	50	Sir Wm. C. Macdonald, for Surveying and Geodetic Apparatus in 1890	1,500
The Local Committee for the reception (1881) of American Society of Civil Engineers			
Forward	$1175	Total	$3,185

8. LIST OF SUBSCRIBERS AND DONORS TO THE EQUIPMENT OF THE NEW ENGINEERING BUILDINGS OF McGILL UNIVERSITY TO MAY, 1900.

Abbott, W.....Equipment
Adams, Capt. R. C. Mining Photographs
American Steam Gauge Co., (Boston) Indicator.
Archbald, H.....Books
Ashton Valve Co. (Boston) Sectional Valve
Aurora Metal Co.....Specimens
Bell Telephone Co.....A set of Telephone Apparatus
Bertram & Sons, J. (Dundas).....24 in. Planer
Bethlehem Iron Co.....Specimens
Birch & Co., J. (England).....Hydraulic Tubes
Birks, Henry.....Clock
Bishop, George.....Equipment
Blackwe l, Kennet.....Equipment
Blake Mnfg. Co., The George F.....Blue Prints of Pump
Blake Pump Co., The Geo. (New York & Boston).....Pump
Bremner, A.....$50
Brockhaus, Herr F. A.....Books
Brodie & Harvey.....$50
Brush, G.....Boiler
Cameron, General.....Rotary Drill
Campbell Tile Co. (England), per Jordan & Locker.....Equipment
Campbell, Kenneth.....$50
Canadian General Electric Co.....(Toronto), per F. Nicholls..Equipment
Canadian General Electric Co.....Electric Drill, Edison Generator, Dynamo, Motor
Canadian Rand Drill Co.....Rock Drill
Carnegie Steel Co.....Specimens
Carsley, S.....$100
Carus-Wilson, Prof. C. A.....Equipment
Cary, A. A.....Photographs of Boilers
Chadwick, F.....Truss Models
Chanteloup, E.....$50
Claxton, T. J.....Timber Beams of large Scantling for Testing Laboratory
Costigan, J.....Equipment
Cowen, Amos.....Samples of Bricks
Cowper, P. H.....Model of Steam Engine
Craig, Messrs. J. & M., (Kilmarnock, Scotland).....Sanitary Sections (full size) and models
Crocker-Wheeler Electric Motor Co., The (New York).....Motor, Armature, Prints
Crosby Steam Gauge and Valve Co., The (Boston).....Gauge and Valve, Indicator and Valves
Darling, Brown & Sharpe (Providence, R. I.).....6 in. Rule
Date, John.....Equipment
Dawson, W. B.....Specimens
Dolworth Mining Co.....5 tons ore
Dominion Coal Co.....Miners' Tools
Dominion Wire Manfg. Co., per F. Fairman.....Shaper
Drummond, Hon. G. A.....Prism
Drysdale, D.....Tools
Drysdale, W.....Tools
Earle, S. R.....Air Injector
Edison General Electric Co.....Two 450 light dynamos, Brake Shoe and Disc.
Egleston, Dr. (New York).....Framed Photograph of the Moon, Books, Photos, etc.
Electric Welding Company, (Boston) Equipment
"Engineering Magazine" (New York City).....Mining Illustrations and Photographs
Eureka Tempered Copper Co. Equipment
Eustis Mining Co.....12 tons ore
Ewan, A.....$100
Felton & Gilleaume.....Samples of Cable Wire, etc.
Forsyth, R.....Equipment
Frothingham & Workman.....Tools
Furlong, G. W., B.A.Sc.....Specimens of Pine and Wood bored by Teredos.
Gardner & Son, R. W.....16 in. Lathe
Gardner, R.....Equipment
Garth & Co.....$500
Garth, Henry.....Equipment
Government of New South Wales.....Collection of Australian Timbers
Government of Queensland, Australia, Collection of Queensland Timbers
Gower, W. E.....
Graham, H.....$100
Grier, G. A.....Equipment
Guggenheim Smelting Co...Specimens
Gurney & Co., E. & C.....$604
Hadfield, Messrs. (Sheffield)..Equipment
Hamilton Bridge Works Co.....A Model of the Stoney Creek Arch
Hamilton Powder Co.....Electrical Blasting Machine, and appliances, etc., for blasting.
Hearn & Harrison, per L. Harrison, Barometer & Clock
Hersey, R.....$1200
Hodgson, Jonathan.....$200
Holden, A.....Equipment
Hosoki, Dr., of Tokio, Japan.....Collection of Japanese Wood

Hoyt Metal Co.....Specimens
Hughes & Stephenson.....Equipment
Hutton, W. H..... ..... Equipment
Ingersoll Rock Drill Co.....Rock Drill
Irwin & Hopper ....Equipment
Ives, H. R..... ....Cupola
Joyce, Alfred..... .... $50
Jordan & Locker ....Equipment
Kennedy, John ....Equipment
Kennedy, W. & Sons..American Turbine
Kennedy, W. (Owen Sound) .....Pump
Kerr, R. & W ....Tools
King & Son, Warden..... ..... $534
Laughlin-Hough Drawing Table Co., Drawing Tables
Lachine Rapids Co.....Electrical
Laurie & Bro. J.....Compound Engine
Lawson, A. J..... ..... Equipment
Lehigh Zinc & Iron Co .....Franklin Furnace, N. J., Mining Specimens & Photographs
Lindsay & Co., C. F.....Equipment
Lovell & Son, John..... .....Books
Lyster, A. G.....Drawings and Sketches of London and Liverpool Docks
Macpherson, A ....Tools
Mason, Dr..... ....Equipment
Maxwell & Co., E. J..... Equipment
McCarthy, D. & J. (Sorel) $300
McDougall, Mrs. J..... .....$4000
McLachlin Bros. (Arnprior) .....Timber
McLaren, D..... ....$100
McLaughlin Bros..... .....Timber
McNally & Co., W..... ..... $100
McPherson Sand Box Co. (Troy, N.Y.) Model of Sand Box
Midvale Steel Co..... .....Specimens
Miller Bros. & Sons..... .....Elevator
Mitchell, P..... .....Equipment ($300)
Mitchell & Co., R..... .....Equipment
Naismith, P. L., B.A.Sc..... Specimens
Nalder Bros. & Co. (England)..... . . Standard Cell
National Electric Mfg. Co..... . .... 100 volt Transformer, Transformers
National Lead Co.. .....Specimens
Nicholson, Peter $100
Norton, A. O., Boston, Mass..... Two Norton Bull-bearing Lifting-jacks
Norton Emery Wheel Co. (Worcester, U.S.)..... .....Equipment
Notman, Wm..... .....Photographs
Ohio Brass Co..... .....Fittings
Ogilvie, W..... .....$500
Packard Elec. Co... .....Transformer
Palmer, A..... ....Equipment
Parker, M..... .....Equipment
Paton, H..... .. ..Equipment
Peckham Motor Truck and Wheel Co. (Kingston, N.Y.)..... .... Model of Motor Truck
Pelton Water Wheel Co. (New York Two Motors
Pennsylvania Railroad Co.....Working Drawings of Locomotives (32)
Phelps Engine Co., per A. R. Williams & Co., Lake Steam Engine, 4 Horse Power Engine
Pillow, J. A..... ....$250
Pittsburgh Reduction Co.....Specimens
Pratt & Whitney (Hartford, Conn)..... Epicycloidal Gear Model
Prowse, G. R .... Equipment
Queensland Government per Sir Thos. McIlwraith.....Collection of Timbers
Radiator Co. (Toronto) $500
Ramsay & Son, A..... .....$100
Rathbun, E. W .....Samples of Fireproof Construction $112
Reddaway & Co, F... Belt (value $50)
Redpath, F. R ....Equipment
Redpath, Mrs..... ..... $100
Reed, G. W..... .... $100
Reford, R..... ..... $1000
Reid, R..... ..... Equipment
Reid, R. G $1000
Renouf, E. M ....Books
Rhode Island Locomotive Works ..... Photos of Locomotives
Rife's Hydraulic Engine Mfg. Co. (Roanoke, Va., U.S.A.).Hydraulic Ram
Robb & Armstrong .... 80 H. P. High Speed Engine
Robertson, J..... .....Equipment
Rogers, Professor (Waterville, Maine) Equipment
Ross, Jas.... ....$500
Rodden, W..... .....Equipment
Royal Electric Co..... ..... Motors 12 Arc Light Dynamos, 30 Light Stanley transformer
Rutherford, W..... ....Equipment
Sadler, G. (Robin & Sadler) .... Belting ($400)
Seeley, John..... ..... Insulators
Schaeffer & Budenbery (Brooklyn, N.Y.) Double Indicator
Scholes, F..... ....$100
Scovill Mfg. Co .....Equipment
Sharp, Stewart & Co. (Manchester, Eng)..... .....Equipment
Shearer, James..... .... $200
Sheppard, Chas..... ..... $200
Siemens Bros. (London, Eng).. ..... Cable Samples
Smith, C. B..... .... Framed Photos of Bridges (2)
Smith, R..... .... Equipment
Spence, J. P., C.E..... .....Specifications and Drawings showing construction of Sault Ste. Marie Canal Locks

Smith, R. Guilford .....Books
Stanley Elect. Co..... .....Wattmeter
Steel Co. of Scotland, The.....
Samples of Cable Wire, etc.
St. George, P. W..... .....Models
Stirling Co., The..... .....
Sectional Blue Prints of Boilers
Sturtevant Co., The B. F. (Boston) .....
Blowers
Swan Lamp Mfg. Co..... .....Lamps
Taylor, A. T..... ..... $300
Tees & Co..... .....Equipment
Thomas, R. & Son.....Insulators
Thomson-Houston Co. (Boston).....
Incandescent dynamos
Twyford & Co.....Equipmen
Vail, Stephen.....Piece of first Tele
graph Wire Use
Walker & Co., James .....Tool
Wanklyn, F. L.....Equipmen
Ward, Hon. J. K..... ..... $5
Warrington Wire Co... .Cable Sample
Weston Elect. Instr. Co. Ammeters, &c
Whittier Machine Co. (Boston) .....
Electric Elevato
Wiley & Sons, John (New York)..Book
Yale & Towne Mfg. Co. (Stamford
Conn)..... ..... Equipmen
Yates & Thom .....
Blue Prints of Machinery

The above representing a total of about $80,000.

9. FACULTY OF APPLIED SCIENCE LIBRARY ENDOWMENT, 1893.

Hugh Paton.....	$ 25	Forward	$ 600
A. Joyce.....	25	W. Rodden	25
R. Gardner.....	50	M. Parker.....	25
H. Garth.....	100	Robin & Sadler.....	50
Hughes & Stephenson.....	100	J. Robertson, Esq.....	50
R. Mitchell	300	Mrs. John McDougall (1895).....	20
Forward.....	$600	Total.....	$ 770

V. ENDOWMENTS AND SUBSCRIPTIONS IN AID OF THE FACULTY OF MEDICINE.

1. LEANCHOIL ENDOWMENT, 1884.

Lord Strathcona and Mount Royal..... .....$50,000

2. CAMPBELL MEMORIAL ENDOWMENT, 1884.

Established to commemorate the service rendered to the Faculty during 40 years by the late Dean, George W. Campbell, M.D., LL.D.

Mrs. G. W. Campbell	$ 2000	Forward.....	$20,000
H. A. Allan, Esq.....	1500	J. C. Wilson, Esq.....	1000
Lord Strathcona and Mount Royal	1500	Mrs. John Redpath.....	1000
Lord Mount Stephen.....	1000	Hon. John Hamilton	1000
R. B. Angus, Esq.....	1000	Miss Orkney.....	1000
Hon. George A. Drummond.....	1000	Hugh Mackay, Esq.....	1000
Alex. Murray, Esq.....	1000	Hector Mackenzie, Esq.	1000
Robert Moat, Esq.....	1000	Thomas Workman, Esq.....	1000
Sir W. C. Macdonald	1000	Hugh McLennan, Esq.....	1000
A Friend.....	1000	O. S. Wood, Esq.....	1000
Duncan McIntyre, Esq	1000	Frank Buller, M.D.....	500
A. F. Gault, Esq.....	1000	James Burnett, Esq.....	500
M. H. Gault, Esq.....	1000	Andrew Robertson, Esq.....	500
G. W. Stephens, Esq.....	1000	Robert Mackay, Esq.....	500
James Benning, Esq.....	1000	John Hope, Esq.....	500
R. P. Howard, M.D.....	1000	Alex. Urquhart, Esq.....	500
G. B. & J. H. Burland, Esqs	1000	R. A. Smith, Esq.....	500
Miss Elizabeth C. Benny.....	1000	George Hague, Esq.....	500
Forward.....	$20,000	Forward	$33,000

Forward	$33,000
J. K. Ward, Esq	500
Warden King, Esq	500
John Stirling, Esq	500
John Rankin, Esq	500
Robert Reford, Esq	500
Messrs. Cantlie, Ewan & Co	500
Messrs. J. & W. Ogilvie	500
Randolph Hersey, Esq	500
John A. Pillow, Esq	500
S. Carsley, Esq	500
D. C. MacCallum, M.D	500
Messrs. S. Greenshields, Son & Co.	500
Jonathan Hodgson, Esq	500
George Ross, M.D	500
T. G. Roddick, M.D	500
Wm. Gardner, M.D	500
Messrs. Cochrane, Cassils & Co	500
Sir Joseph Hickson	500
Allan Gilmour, Esq., Ottawa	500
R. W. Shepherd, Esq	500
G. E. Fenwick, M.D	300
Miles Williams, Esq	300
G. P. Girdwood, M.D	250
Charles F. Smithers, Esq	250
John Kerry, Esq	250
A. Baumgarten, Esq	250
R. W. Elmenhorst, Esq	250
W. F. Lewis, Esq	250
George Armstrong, Esq	250
J. M. Douglas, Esq	250
Messrs. H. Lyman, Sons & Co	250
F. J. Shepherd, M.D	250
Duncan McEachran, Esq., F. R. C. V. S	200
Benj. Dawson, Esq	200
R. Wolff, Esq	150
James Stuart, M.D	150
A. T. Paterson, Esq	100
H. W. Thornton, M.D. (New Richmond, Q.)	100
C. B. Harvey, M.D. (Yale, B.C.)	100
D. Cluness, M.D. (Nanaimo, B.C.)	100
W. Kinlock, Esq	100
Hua, Richardson & Co	100
Mrs. Cuthbert (N. Richmond, Q.)	100
J. M. Drake, M.D	100
Forward	$47,600

Forward	$47,600
Hugh Patton, Esq	100
R. T. Godfrey, M.D	100
T. A. Rodger, M.D	100
W. A. Dyer, Esq	100
Geo. W. Wood, M.D. (Faribault, Minn.)	100
A. A. Browne, M.D	100
Geo. Wilkins, M.D	100
R. L. MacDonnell, M.D	100
Jos. Workman, M.D. (Toronto)	50
Henry Lunam, B.A., M.D. (Campbellton, N.B.)	50
Hon. Sir A. T. Galt	50
T. J. Alloway, M.D	30
R. J. B. Howard, M.D	25
Louis T. Marceau, M.D. (Napierville, Q.)	25
Griffith Evans, M.D. (Vet. Dept. Army	26
J. J. Farley, M.D. (Belleville)	25
Henry R. Gray, Esq	25
J. E. Brouse, M.D. (Prescott)	20
R. N. Rinfret (Quebec)	20
Robert Howard, M.D. (St. Johns)	20
Drs. J. & D. J. McIntosh (Vankleek Hill)	20
J. H. McBean, M.D	15
J. C. Rattray, M.D. (Cobden, O.)	10
E. H. Howard, M.D. (Lachine)	10
J. W. Oliver, M.D. (Clifton, O.)	10
D. A. McDougall, M.D. (Ottawa, O.)	10
A. Poussette, M.D. (Sarnia, O.	10
A. Ruttan, M.D. (Napanee, O.)	10
James Gunn, M.D. (Durham, O.)	10
J. McDiarmid, M.D. (Hensall, O.)	5
W. J. Derby, M.D. (Rockland, O.)	5
J. Gillies, M.D. (Teeswater, O.)	5
J. B. Benson, M.D. (Chatham, N.B.)	5
L. A. Fortier, M.D. (St. David Q.)	5
J. A. McArthur, M.D. (Fort Elgin, O.)	5
John Campbell, M.D. (Seaforth, O.)	5
Total	$48,906

3. ENDOWED CHAIRS, DONATIONS, ETC.

LORD STRATHCONA AND MOUNT ROYAL CHAIR OF PATHOLOGY, endowed in 1893 by the Lord Strathcona and Mount Royal with the sum of	$ 50,000
LORD STRATHCONA AND MOUNT ROYAL ENDOWMENT FOR THE DEPARTMENT OF HYGIENE, endowed in 1893 by the Lord Strathcona and Mouat Royal with the sum of	50,000
MRS. MARY DOW BEQUEST—Bequest by the will of the late Mrs. Mary Dow for the Faculty of Medicine, 1893, $10,000, less Government Tax of 10 per cent	9,000
JOHN H. R. MOLSON DONATION—in 1893, $25,000 for the purchase of land and $35,000 for additional building and equipment	60,000
WALTER DRAKE, ESQ., for benefit of Chair of Physiology, an annual donation of $500 given 1891 to 1897	3,500

DR. ROBERT CRAIK FUND—

Mr. John McDougall, toward formation of above			(1893-94).	1,000
Jane F. Learmont, bequest	do	do	(1894).....	3,000
				4,000

JOSEPH MORLEY DRAKE, CHAIR OF PHYSIOLOGY, endowed in 1898 by Walter Drake, Esq., with the sum of..... 10,000

LADY STRATHCONA AND MOUNT ROYAL Donation for erection and equipment Additional Buildings (1899)..... 50,000

HON. MRS. HOWARD Donation for erection and equipment Additional Buildings (1899)..... 50,000

4. MEDALS AND SCHOLARSHIPS.

In 1865 the "Holmes Gold Medal" was founded by the Faculty of Medicine as a memorial of the late Andrew Holmes, Esq., M.D., LL.D., late Dean of the Faculty of Medicine, to be given to the best student in the graduating class in Medicine, who should undergo a special examination in all the branches whether Primary or Final.

In 1878 the "Sutherland Gold Medal" was founded by Mrs. Sutherland of Montreal, in memory of her late husband, Prof. William Sutherland, M.D., for competition in the classes of Theoretical and Practical Chemistry in the Faculty of Medicine, together with creditable standing in the Primary Examinations.

THE DAVID MORRICE SCHOLARSHIP—in the subject of Institutes of Medicine, in the Faculty of Medicine—founded in 1881—value $100. (Terminated in 1883).

5. LIBRARY, MUSEUM AND APPARATUS.

For the fittings of the Library and Museum of the Faculty of Medicine, 1872.

G. W. Campbell, A.M., M.D.	$1200	Forward	$2,000
W. E. Scott, M.D	200	Robert Craik, M.D	200
Wm. Wright, M.D	200	Geo. E. Fenwick, M.D	200
Robert P. Howard, M.D	200	Joseph M. Drake, M.D	200
Duncan C. MacCallum, M.D	200	George Ross, M.A., M.D	50
Forward	$2,000	Total	$2,650

The Professors and Lecturers in the Summer Sessions of the Faculty of Medicine..... Donation to Apparatus, Museum Library, etc., of the Medical Faculty, 1887, $1,182; 1888, $1,023. $2,205

For Physiological Laboratory of Faculty of Medicine, 1879.

Dr. Campbell	$100	Forward	$700
Dr. Howard	100	Dr. Ross	50
Dr. Craik	100	Dr. Roddick	50
Dr MacCallum	100	Dr. Buller	50
Dr. Drake	100	Dr. Gardner	50
Dr. Godfrey	100	Dr. Osler	50
Dr. McEachran, F.R.C.V.S	100		
Forward	$700	Total	$950

Cameron Obstetric Collections.

Dr J. C. Cameron..... $10,000

6. MISCELLANEOUS.

Anonymous Donor toward Expenses of Pathology for Session 1892-93..... $500

Contributors towards salary of Research Fellow in the Department of Pathology, 1900.

James Ross, Esq	$2,500
R. B. Angus, Esq	2,500
Total	$5,000

VI. ENDOWMENTS AND SUBSCRIPTIONS FOR THE FACULTY OF LAW.

1. ENDOWED CHAIRS, ETC.

THE GALE CHAIR, in the Faculty of Law, endowed in 1884 by the late Mrs. Andrew Stuart (*née* Agnes Logan Gale) of Montreal, in memory of her father, the late Hon. Mr. Justice Gale.—$25,000.

THE MACDONALD FACULTY OF LAW ENDOWMENT, founded by Sir Wm. C. Macdonald, in 1890—$150,000. Supplemented in 1897 by $50,000. Total $200,000.

Sir Wm. C. MACDONALD, remodelling part of East Wing in 1895 for Class Rooms, Lecture Rooms, etc., for Law Faculty.

2. MEDAL.

In 1865 the "Elizabeth Torrance Gold Medal" was founded and endowed by John Torrance, Esq., of St. Antoine Hall, Montreal, in memory of the late Mrs. John Torrance, for the best student in the graduating class in Law, and more especially for the highest proficiency in Roman Law.

VII. GRADUATES' FUNDS.

1. THE FUND FOR ENDOWMENT OF THE LIBRARY.

The Graduates' Society of the University, in 1876, passed the following Resolution:—

Resolved:—"That the members and graduates be invited to subscribe to a fund "for the endowment of the Libraries of the University; said fund to be invested "and the proceeds applied under the supervision of the Council of the Society in "annual additions to the Libraries; an equitable division of said proceeds to be "made by the Council between the University Library and those of the Profes-"sional Faculties."

In terms thereof subscriptions have been paid in to the Graduates's Society, amounting in all to $3,120; the interest on which is annually expended in the purchase of books for the several libraries under the direction of a special committee appontedi for that purpose.

2. THE DAWSON FELLOWSHIP FOUNDATION.

The Graduates' Society of the University, in 1880, and in commemoration of the completion by Dr. Dawson of his twenty-fifth year as Principal, resolved to raise, with the assistance of their friends, a fund towards the Endowment of the Fellowship under the above name.

Details of the scheme can be had from the Treasurer, Francis Topp, B.A., B.C.L. The following subscriptions have been announced to date, May 1st, 1897. They are payable in one sum, in instalments, without interest or with interest till payment of capital, as subscribers have elected.

Alphabetically arranged.

Abbott, H., B.C.L.	$ 60
Archibald, H., B.A.Sc.	20
Bethune, M. B., M.A., B.C.L.	50
Carter C. B., B.C.L.	100
Cruickshank, W. G., B.C.L.	100
Dawson, W. B., M.A., Ma.E.	50
Dougall, J. R., M.A.	250
Gibb, C., B.A.	100
Hall, Rev. Wm., M.A.	100
Hall, J. S., jun., B.A., B.C.L.	100
Harrington, B. J., B.A., Ph.D.	50
Hutchinson, M., B.C.L.	400
Kirby, J., LL.D., D.C.L.	50
Krans, Rev. E. H., M.A., LL.D.	100
Leet, S. P., B.C.L.	100
Lighthall, W. D., M.A., B.C.L.	100
Forward	$1,730

Forward	$1,730
Lyman, H. H., M.A.	100
Lyman, A. C., M.A., B.C.L.	50
McCormick, D., B.C.L.	100
McGibbon, R. D., B.A., B.C.L.	100
McGoun, A., jun. M.A., B.C.L.	50
McLennan, J. S., B.A.	100
Ramsay, R. A., M.A., B.C.L.	50
Spencer, J. W., B.A.Sc., Ph.D.	50
Stephen, C. H., B.C.L.	100
Stewart, D. A., B.A.Sc.	20
Stewart, J., M.D.	60
Tait, M. M., B.C.L.	100
Taylor, A. D., B.A., B.C.L.	100
Trenholme, N. W. M.A., D.C.L.	40
Total to date	$3,110

EXAMINATION PAPERS

—OF THE—

McGILL UNIVERSITY,

MONTREAL.

SESSION OF 1899-00.

Montreal:
PRINTED BY JOHN LOVELL & SON,
ST. NICHOLAS STREET.
1900.

McGILL UNIVERSITY

ORDER OF EXAMINATION PAPERS.

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ENTRANCE EXAMINATIONS.

FACULTIES OF ARTS, APPLIED SCIENCE, AND MEDICINE.

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ENGLISH GRAMMAR.

ARTS, APPLIED SCIENCE, AND MEDICINE.

MONDAY, SEPT. 18TH :—9-10.30 a m.

1. (*a*) Parse and analyse: I heard yesterday that he has declined the post which was offered him.

(*b*) Analyse : The more he earns, the less he spends.

2. Classify the languages which belong to the Teutonic stock.

3. State what kind of noun each of the following is : room, beauty, nobility, army, a Wellington. Give reasons for your answers.

4. Give the possessive plural of mouse, conscience, son-in-law, and the possessive singular of *Jones the blacksmith*. Give, with an instance of each, two suffixes of English and three of foreign origin which indicate gender.

5. State and exemplify the uses of *but, since, as*.

6. State what kind of adjective each of the following is: tall, any, first, this. Give the comparative and the superlative of little, few, many.

7. Take the verb *see* and give the second person singular of

(*a*) the present imperfect (or continuous) subjunctive.

(*b*) the present perfect indicative.

(*c*) the future perfect subjunctive.

Give the corresponding passive forms. Explain and illustrate impersonal verb, defective verb.

8. State what kind of adverb each of the following is : quite, thus, where, when, badly.

9. Exemplify the various ways in which the subject of a verb may be modified.

10. Exemplify the various ways in which the predicate may be modified.

ENGLISH HISTORY.

ARTS, APPLIED SCIENCE, AND MEDICINE.

MONDAY, SEPTEMBER 18TH :—10.30-12 A.M.

Answer any five questions.

1. Follow out the personal fortunes of Earl Godwin and his sons.

2. Describe in order the main constitutional changes which were effected between the death of Henry II. and the accession of Edward II. Explain the general scope of each measure given in your list.

3. Mention the causes, the landmarks (with dates) and the results of the Wars of the Roses.

4. Sketch the relations of England and Scotland between 1603 and the legislative union of the two countries.

5. What was the origin of the Jacobite question, and to what disturbances did it lead?

6. Name consecutively the prime ministers of Queen Victoria's reign, and explain the nature of the political work with which each is most clearly connected.

DICTATION.

ARTS, APPLIED SCIENCE, AND MEDICINE.

MONDAY, SEPT. 18TH :—2-2.30 p.m.

It was no light matter which had so roused the soldier's admiration. Out of the haze which still lay thick upon our right there twinkled here and there a bright gleam of silvery light, while a dull thundering noise broke upon our ears like that of the surf upon a rocky shore. More and more frequent came the fitful flashes of steel, louder and yet louder grew the hoarse gathering tumult, until of a sudden the fog was rent, and the long lines of the Royal cavalry broke out from it, wave after wave, rich in scarlet and blue and gold, as grand a sight as ever the eye rested upon. There was something in the smooth steady sweep of so great a body of horsemen which gave the feeling of irresistible power. Rank after rank, and line after line, with waving standards, tossing manes and gleaming steel, they poured onwards, an army in themselves, with either flank still shrouded in the mist. As they thundered along, knee to knee and bridle to bridle, there came from them such a gust of deep-chested oaths with the jangle of harness, the clash of steel, and the measured beat of multi-

tudinous hoofs, that no man who hath not stood up against such a whirl wind, with nothing but a seven-foot pike in his hand, can know how hard it is to face it with a steady lip and a firm grip.

ENGLISH LITERATURE AND COMPOSITION.

ARTS, APPLIED SCIENCE AND MEDICINE.

MONDAY, SEPTEMBER 18TH :—2.30-5.30 P.M.

(Candidates will answer A and B and D in separate books OR *A and C, and D in separate books.)*

A. SCOTT: *The Lady of the Lake.*

1. Write short notes on : The Taghairm, coronach, pibroch, Coir-nan Uriskin.

2. Give an outline account of the Chase *or* The Combat.

3. Explain the nature of the verse employed by Scott in the narrative and descriptive parts of The Lady of the Lake ; and scan any six typical verses.

4. Discuss the character of Roderick Dhu, *or* of Douglas, with illustrative quotations from the texts.

B. SHAKSPERE : *Richard II.*

1. Give the substance of Gaunt's dying speech, and quote from ten to twenty lines of it.

2. Say by whom and on what occasion the following passages are spoken :

(*a*) For God's sake, let us sit upon the ground
And tell sad stories of the death of kings.

(*b*) Though I did wish him dead,
I hate the murderer, love him murdered.

(*c*) O, who can hold a fire in his hand
By thinking on the frosty Caucasus ?

(*d*) Speak it in French, king ; say '*pardonnez-moi.*'

(*e*) Grace me no grace, nor uncle me no uncle.

(*f*) How sour sweet music is,
When time is broke and no proportion kept !

3. Accent and scan the following lines, explaining the words in italics :—

(*a*) And daily new exactions are devised
As *blanks*, *benevolences*, and I wot not what.

(*b*) 'Twill make me think the world is full of rubs.
And that my fortune runs *against the bias.*

(*c*) *Bereft* and gelded of his *patrimony*.

(*d*) While I stand fooling here, his *Jack o' the clock*.

4. Give a few instances of playing upon words in Richard II.

C. WORDSWORTH: (*Selections.*)

1. Give, in ten or twelve lines to each, an outline of (*a*) Michael, (*b*) Character of the Happy Warrior.

2. Quote or give the substance of a leading thought in each of the following poems :

(*a*) The Daisy.
(*b*) To my Sister.
(*c*) Expostulation and Reply.
(*d*) The Tables Turned.

3. How does Wordsworth speak of the influence of the poetry of Burns on him, of their respective characters, and of their imaginary intercourse?

4. Quote or give the substance of the Sonnet on the Sonnet, and explain allusions.

5. Take some characteristic of Wordsworth's poetry, and illustrate it from the poems you have read. (Limit your answer to a page.)

D. ENGLISH COMPOSITION.

Write an essay of not less than two pages on any *one* of the following subjects :—

A National Hero.
Holiday Recollections.
A Recent Scientific Discovery.

GEOMETRY—ARITHMETIC.

ARTS, APPLIED SCIENCE, AND MEDICINE.

FRIDAY, SEPTEMBER 15TH :—MORNING, 9 TO 12.

Questions under A to be answered by all candidates.
Questions under B (in addition to A) by those who take "Additional Mathematics and Entrance into Applied Science.

A

1. To a given straight line, apply a parallelogram, which shall be equal to a given triangle and have one of its angles equal to a given angle.

2. If a straight line be divided into any two parts, the sum of the squares of the whole line and of one of the parts is equal to twice the rectangle under the whole line and that part, together with the square of the other part.

3. In any triangle, the square on the side subtending an acute angle is less than the sum of the squares of the sides containing the angle by twice the rectangle under either of the sides and the intercept on it between the acute angle and the perpendicular let fall on it from the opposite angle.

(*a*) In any triangle the sum of the squares of the sides is equal to twice the square of half the base together with twice the square of the line joining the vertex in the middle point of the base.

4. Angles in the same segment of a circle are equal to one another.

5. If a tangent be drawn to a circle, and from the point of contact a chord be drawn, the angles which the chord makes with the tangent are equal to the angles in the alternate segments of the circle.

(*a*) Two circles touch each other externally, prove that any line drawn through the point of contact, cutting the circles, cuts off similar segments from the two circles.

6. Extract the square root of 13704804.

7. Divide $27,200 among three persons in shares proportional to the numbers 8, 5, 3.

8. From the sum of $3\frac{1}{2}+2\frac{1}{4}-1\frac{1}{8}$ subtract the half of $1\frac{1}{8}$; multiply the remainder by 1.06 and divide the product by 3.124.

9. Express in kilogrammes the weight of a beam of wood which is 4 m. 45cm. long, 24cm. broad and 20cm. thick, assuming that the wood weighs 55 times as much as an equal bulk of water.

B

10. Inscribe a regular pentagon in a given circle.

(*a*) All the diagonals of a regular pentagon intersect so as to form another regular pentagon.

11. Find a mean proportional between two given straight lines.

(*a*) If two circles touch each other, and also touch a given straight

line, the part of the common tangent between the points of contact is a mean proportional between the diameters of the circles.

12. Triangles of equal area, which have one angle of the one equal to one angle of the other, have their sides about the equal angles reciprocally proportional.

13. If three straight lines be proportionals, the rectangle contained by the extremes is equal to the square of the mean.

ALGEBRA AND TRIGONOMETRY.

ARTS, APPLIED SCIENCE, AND MEDICINE.

FRIDAY, SEPTEMBER 15TH:—AFTERNOON, 2 TO 5.

Questions under A are for all candidates. Questions under B are for those in Arts taking Additional Mathematics.

Candidates for entrance into Applied Science will take A and the Trigonometry (10 *to* 14) *under B.*

I. ALGEBRA.

A.

1. Find the factor of (1) x^3-4x^2+4x, (2) x^3-27y^3, (3) $2x^2-5x+2$, (4) x^3-x^2+x-1.

2. Simplify the following:

(1) $\dfrac{x^4+a^2x^2+a^4}{x^4+ax^3-a^3x-a^4}$,

(2) $1+\dfrac{a}{x-a}+\dfrac{bx}{(x-a)(x-b)}+\dfrac{cx}{(x-a)(x-b)(x-c)}$.

3. Solve the equations:

(1) $\dfrac{x+4}{x-1}-\dfrac{x-3}{x+3}=\dfrac{7}{2}$,

(2) $(x-a)^3+(x-b)^3+(x-c)^3=3(x-a)(x-b)(x-c)$

(3) $\sqrt{x+3}+\sqrt{x+8}=5\sqrt{x}$,

(4) $\begin{cases} cy+bz=bc, \\ az+cx=ca, \\ bx+ay=ab. \end{cases}$

4. Solve the general quadratic $ax^2+bx+c=0$ and show

(1) that the sum of the roots $= -\frac{b}{a}$,

(2) that the product of the roots $= \frac{c}{a}$,

(3) that the square of the difference of the roots $= \left(\frac{b}{a}\right)^2 - 4\frac{c}{a}$,

(4) that $a^2 + 4\,a\,c - b^2 = 0$ if the roots are two successive integers.

5. Simplify $\frac{1}{(2+\sqrt{3})^2} + \frac{1}{(2-\sqrt{3})^2}$.

B.

6. Determine a formula for finding the sum of any number of terms of an Arithmetical Progression. When 29 arithmetical means are inserted between 5 and 69, what is the common difference?

7. How many words can be made by using all the letters of the work abracadabra?

8. Express the common logarithms of 1·5, 4·8, 7·5 in terms of the common logarithms of 2 and 3.

9. Prove that any number expressed in the scale of r is divisible by $r - 1$ if the sum of its digits is divisible by $r - 1$.

II. TRIGONOMETRY.

10. State and prove the rule for changing an angle from circular (radian) measure to degrees or seconds.

11. Make two positive unequal angles whose sines are each $\frac{2}{3}$. Find the cosines of these angles.

12. Write down the signs and numerical values of the following: sin 45°, cos 135°, sin 210°, tan 225°.

13. Prove that

(1) $\sec^2 A = 1 + \tan^2 A$,

(2) $(\sec A - \tan A)^2 = \frac{1 - \sin A}{1 + \sin A}$,

(3) $\sin(A - B) = \sin A \cos B - \cos A \sin B$,

(4) $\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$.

(5) $\dfrac{\tan A - \tan B}{\tan A + \tan B} = \dfrac{\sin (A - B)}{\sin (A + B)}$.

14. Given $\sin A = \frac{2}{3}$, show that $\sin 2A = \pm \frac{4}{9}\sqrt{5}$, $\cos 2A = \frac{1}{9}$.

When is $\sin 2A$ plus? when minus?

LATIN.

ARTS, APPLIED SCIENCE, AND MEDICINE.

I. LATIN GRAMMAR.

THURSDAY, SEPT. 14TH :—2 TO 5 P.M.

1. Decline *Anchises, vir, vis ; puer aeger ; pedes velox.*
(Mark all long vowels with the usual sign.)

2. Compare *nequam, celer, maledicus.* Form adverbs from *acer, sapiens, carus,* and compare the adverbs.

3. Translate into Latin (*a*) One hundred and forty ; (*b*) He gave them two talents each ; (*c*) In the year 1899.

4. Decline the Interrogative *quis* and the pronominal adjective *neuter.*

5. Write out the Future Infinitive of *sum,* the Gerund of *do,* the Future Act. Indic. of *deleo,* the Imperfect Subjunctive of *fero.*

6. Give the principal Parts of *labor, morior, posco, haurio, caedo.*

7. Point out the difference between (*a*) Subjective and Objective Genitive ; (*b*) *ire ad Athenas* and *ire Athenas.*

8. How is the Agent expressed in Latin ? Give examples.

II. LATIN PROSE COMPOSITION.

1. To this course Orgetorix persuaded his fellow-citizens very easily.

2. By these arguments they were induced to exchange a pledge and an oath.

3. This river could be crossed in two places by fording.

4. If they do this, it will be very perilous to the Province.

5. Is my father alive ? Do you not remember ? Tell me what I am asking.

LATIN.

TRANSLATION AT SIGHT.

ARTS, APPLIED SCIENCE, AND MEDICINE.

THURSDAY, SEPT. 14TH:—11 TO 12 A.M.

I.

Adherbal, ubi intelligit omnes suas fortunas in extremo, sitas, hostem infestum, auxilii spem nullam, *penuria rerum necessariarum bellum trahi non posse; ex iis, qui una Cirtam profugerant, duos maxime impigros delegit; eos, multa pollicendo ac miserando casum suum, confirmat, uti per hostium munitiones noctu ad proximum mare, deinde Romam pergerent.

*penuria, *scarcity*.

II.

Territus e summo despexit in aequore caelo:
Nox oculis pavido venit [1] oborta metu:
Tabuerant cerae: nudos quatit ille lacertos,
Et trepidat, nec, quo sustineatur, habet.
Decidit atque cadens, "Pater, O Pater, auferor," inquit,
Clauserunt virides ora loquentis aquae.
At pater infelix, nec iam pater, "Icare," clamat,
"Icare," clamat "ubi es? quove sub axe-volas?"
"Icare," clamabat: pennas aspexit in undis:
Ossa tegit tellus; aequora nomen habent.

[1] oborior, *arise, appear*.

LATIN.

CAESAR AND VIRGIL.

ARTS, APPLIED SCIENCE, AND MEDICINE.

THURSDAY, SEPT. 14TH:—9 TO 11 A.M.

1. Translate:

(*a*) Haec eodem tempore Caesari mandata referebantur et legati ab Aeduis et a Treviris veniebant: Aedui questum quod Harudes qui nuper in Galliam transportati essent fines eorum popularentur; sese ne obsidibus quidem datis pacem Ariovisti redimere potuisse: Treviri autem pagos centum Suevorum ad ripas Rheni consedisse qui Rhenum transire conarentur; his praeesse Nasuam et Cimberium fratres. Quibus rebus Caesar vehementer commotus maturandum sibi existimavit, ne, si nova manus

Suevorum cum veteribus copiis Ariovisti sese coniunxisset, minus facile resisti posset. Itaque re frumentaria quam celerrime potuit comparata magnis itineribus ad Ariovistum contendit.

(*b*) His rebus gestis omni Gallia pacata tanta huius belli ad barbaros opinio perlata est uti ab iis nationibus quae trans Rhenum incolerent mitterentus legati ad Caesarem, qui se obsides daturas, imperata facturas pollicerentur. Quas legationes Caesar, quod in Italiam Illyricumque properabat, inita proxima aestate ad se reverti iussit. Ipse in Carnutes, Andes Turonesque, quae civitates propinquae his locis erant ubi bellum gesserat, legionibus in hibernacula deductis, in Italiam profectus est: ob easque res ex litteris Caerasis dies quindecim supplicatio decreta est, quod ante id tempus accidit nulli.

(*c*) Olli subridens hominum sator atque deorum
vultu, quo caelum tempestatesque serenat,
oscula libavit natae; dehinc talia fatur:
Parce metu, Cytherea; manent immota tuorum
fata tibi; cernes urbem et promissa Lavini
moenia, sublimemque feres ad sidera caeli
magnanimum Aenean; neque me sententia vertit.

(*d*) Cum venit, aulaeis iam se regina superbis
aurea composuit sponda, mediamque locavit;
iam pater Aeneas, et iam Troiana iuventus
conveniunt, stratoque super discumbitur ostro.
Dant famuli manibus lymphas, Cereremque canistris
expediunt, tonsisque ferunt mantelia villis.

2. Carefully explain the grammatical construction of the following words or phrases:

(*Ext. a*), *tempore, Caesari, questum, popularentur, his, maturandum, comparata.*

(*Ext. b*), *incolerent, mitterentur, se obsides, daturas, locis.*

(*Ext. c*), *olli, metu.*

3. Scan, marking the quantities and Caesural pauses, the first three lines of *Ext. d.*

4. Briefly sketch the plot of the First Book of the Aeneid.

GREEK GRAMMAR.

ARTS, APPLIED SCIENCE, AND MEDICINE.

THURSDAY, SEPT. 21ST:—AFTERNOON, 2 TO 3.30.

1. Gen. Sing. and Dat. Plur. πλοῦς, νεώς, προδότης, ῥήτωρ, στάς, κέρας.

2. Compare : ὀξύς, χαρίεις, αἰσχρός, μικρός, ῥᾴδιος, ἐγγύς.

3. 2nd Sing. Impf. Ind. Act. 3rd Sing. Pres. Imperat. Act. 3rd Plur. Aor. Opt. Act. Acc. Sing, Masc. Perf. Act. Part. 2nd Plur. Pres. Subj. Mid. Fut. Infin. Pass. of ἵστημι, στελλω, ἐρωτάω, ἀδικέω, ταττω, ἐπιτηδεύω.

4. Give the prepositions that can take two cases, and their meanings.

5. Give briefly the constructions used : (*a*) with verbs of Fearing, (*b*) in consecutive sentences, (*c*) in subordinate clauses in Oratio Obliqua.

GREEK PROSE.

ARTS, APPLIED SCIENCE, AND MEDICINE.

SEPT. 21 :—3.30 TO 5 P.M.

1. The Queen had a palace on the river.

2. Xenophon too used to hunt asses in the desert.

3. A messenger arrived from Cyrus with jars of wine as a present for Clearchus.

4. The soldiers had to cut down the trees all round the camp.

5. Give the man some money and bid him go.

6. Later the same men came back and announced that they were ready to go up with Cyrus and obey their generals.

7. He said he would not go away.

8. When the enemy was defeated, the general mounted his horse and pursued the fugitives into the villages.

GREEK UNSEEN TRANSLATION.

ARTS, APPLIED SCIENCE, AND MEDICINE.

THURSDAY, SEPT. 21ST:—MORNING, 11 TO 12.

ἐκ τούτου συνελθόντων εἶπε πάλιν Ξενοφῶν. Ὦ ἄνδρες, ἐπὶ μὲν τῇ πορείᾳ, ὡς ὁρᾶτε, τὰ ἱερὰ οὔπω γίγνεται· τῶν δ' ἐπιτηδείων ὁρῶ ὑμᾶς δεομένους ; ἀνάγκη οὖν μοι δοκεῖ εἶναι θύεσθαι περὶ αὐτοῦ τούτου. ἀναστάς τις εἶπε· Καὶ εἰκότως ἄρα ἡμῖν οὐ γίγνεται τὰ ἱερά· ὡς γὰρ ἐγὼ ἀπὸ τοῦ αὐτομάτου χθὲς ἥκοντας πλοίου ἤκουσά τινος, ὅτι Κλέανδρος ὁ ἐκ Βυζαντίου ἁρμοστὴς μέλλει ἥξειν πλοῖα καὶ τριήρεις ἔχων. ἐκ τούτου δὲ ἀναμένειν μὲν πᾶσιν ἐδόκει· ἐπὶ δὲ τὰ ἐπιτήδεια ἀναγκὴ ἦν ἐξιέναι. καὶ ἐπὶ τούτῳ πάλιν ἐθύετο εἰς τρίς, καὶ οὐκ ἐγίγνετο τὰ ἱερά καὶ ἤδη καὶ ἐπὶ σκηνὴν ἰόντες τὴν Ξενοφῶντος ἔλεγον. ὅτι οὐκ ἔχοιεν τὰ ἐπιτήδεια. ὁ δ' οὐκ ἂν ἔφη ἐξαγαγεῖν μὴ γιγνομένων τῶν ἱερῶν.

GREEK.

XEN. ANAB. I.

ARTS, APPLIED SCIENCE, AND MEDICINE.

THURSDAY, SEPT. 21ST:—MORNING, 9 TO 11.

1. Translate :—Κῦρος δὲ ἐπεὶ εἰσήλασεν εἰς τὴν πόλιν μετεπέμπετο τὸν Συεννεσιν πρὸς ἑαυτόν· ὁ δ' οὔτε πρότερον οὐδενί πω κρείττονι ἑαυτοῦ εἰς χεῖρας ἐλθεῖν ἔφη οὔτε τότε Κύρῳ ἰέναι ἤθελε, πρὶν ἡ γυνὴ αὐτὸν ἔπεισε καὶ πίστεις ἔλαβε. μετὰ δὲ ταῦτα ἐπεὶ συνεγένοντο ἀλλήλοις, Συέννεσις μὲν ἔδωκε Κύρῳ χρήματα πολλὰ εἰς τὴν στρατιάν, Κῦρος δὲ ἐκείνῳ ὧρα, ἃ νομίζεται παρὰ βασιλεῖ τίμια, ἵππον χρυσοχάλινον καὶ στρεπτὸν χρυσοῦν καὶ ψέλια καὶ ἀκινάκην χρυσοῦν καὶ στολὴν Περσικήν, καὶ

τὴν χώραν μηκέτι ἀφαρπάζεσθαι· τὰ δὲ ἡρπασμένα ἀνδράποδα, ἤν που ἐντυγχάνωσιν, ἀπολαμβάνειν.

2. Parse fully the words underlined, giving principal parts, and defining the constructions.

3. Κῦρος δὲ συγκαλέσας τοὺς στρατηγοὺς εἶπεν. Ἀπολελοίπασιν ἡμᾶς Ξενίας καὶ Πασίων. ἀλλ' εὖ γε μέντοι ἐπιστάσθωσαν, ὅτι οὔτε ἀποδεδράκασιν· οἶδα γάρ, ὅπῃ οἴχονται· οὔτε ἀποπεφεύγασιν· ἔχω γὰρ τριήρεις ὥστε ἑλεῖν τὸ ἐκείνων πλοῖον· ἀλλὰ μὰ τοὺς θεοὺς οὐκ ἔγωγε αὐτοὺς διώξω, οὐδ' ἐρεῖ οὐδείς, ὡς ἐγώ, ἕως μὲν ἂν παρῇ τις, χρῶμαι, ἐπειδὰν δέ ἀπιέναι βουλήται, σύλλαβὼν καὶ αὐτοὺς κακῶς ποιῷ καὶ τὰ χρήματα ἀποσυλῶ. ἀλλ' ἰόντων, εἰδότες, ὅτι κακίους εἰσὶ περὶ ἡμᾶς ἢ ἡμεῖς περὶ ἐκείνους. καίτοι ἔχω γε αὐτῶν καὶ τέκνα καὶ γυναῖκας ἐν Τράλλεσι φρουρούμενα· ἀλλ' οὐδὲ τούτων στερήσονται, ἀλλ' ἀπολήψονται τῆς πρόσθεν ἕνεκα περὶ ἐμὲ ἀρετῆς.

4. Give the construction of οἴχονται.—ἑλεῖν.—παρῇ.—ἰόντων.—τούτων στερήσονται.

5. Translate with comments:—ὅπως δὲ καὶ εἰδῆτε, εἰς οἷον ἔρχεσθε ἀγῶνα ὑμᾶς εἰδὼς διδάξω. τὸ μὲν γὰρ πλῆθος πολὺ καὶ κραυγῇ ἐπίασιν· ἂν δὲ ταῦτα ἀνάσχησθε, τὰ ἄλλα καὶ αἰ αἰσχύνεσθαί μοι δοκῶ, οἵους ἡμῖν γνώσεσθε τοὺς ἐν τῇ χώρᾳ ὄντας ἀνθρώπους.

6. Translate explaining the construction of words underlined:—

(α) παρὰ μὲν Κύρου δούλου ὄντος οὐδεὶς ἀπῄει πρὸς βασιλέα, πλὴν Ὀρόντας ἐπεχείρησε· καὶ οὗτος δή, ὃν ᾤετο πιστὸν οἱ εἶναι, ταχὺ αὐτὸν εὗρε Κύρῳ φιλαίτερον ἢ ἑαυτῷ.

(*b*) φανερὸς δ' ἦν καὶ εἴ τίς τι ἀγαθὸν ἢ κακὸν ποιήσειεν αὐτόν, νικᾶν πειρώμενος· καὶ εὐχὴν δέ τινες αὐτοῦ ἐξέφερον, ὡς εὔχοιτο τοσοῦτον χρόνον ζῆν, ἔστε νικῴη καὶ τοὺς εὖ καὶ τοὺς κακῶς ποιοῦντας ἀλεξόμενος.

(*c*) Κῦρος δὲ τούτοις ἀπορῶν τε καὶ λυπούμενος μετεπέμπετο τὸν Κλέαρχον. ὁ δὲ ἰέναι μὲν οὐκ ἤθελε, λάθρᾳ δὲ τῶν στρατιωτῶν πέμπων αὐτῷ ἄγγελον ἔλεγε θαρρεῖν ὡς καταστησομένων τούτων εἰς τὸ δέον.

7. Write notes on φοινικιστής.—ἀμφ' ἀγορὰν πλήθουσαν.—Klearchos.

8. Give a short account of Xenophon's life and his connection with Socrates.

FRENCH.

ARTS, APPLIED SCIENCE, AND MEDICINE.

TUESDAY, SEPTEMBRE 19TH:—MORNING, 9 TO 12.

A.

1. Translate the following passages into English:

(*a*) Un âne trouva une peau de lion et s'en revêtit. Tous les animaux fuyaient devant lui. Enfin il rencontra son maître qu'il voulut épouvanter aussi; mais le bon homme apercevant quelque chose de long aux deux côtés de la tête de l'animal, lui dit: Maître baudet, quoique vous soyez vêtu comme un lion, vos oreilles vous trahissent et montrent que vous n'êtes seulement qu'un âne.

Un sot a toujours un endroit qui le découvre et le rend ridicule.

(*b*) On leva l'ancre. Le soleil se couchait quand le pilote côtier nous quitta après nous avoir mis hors des passes. Le temps était sombre la brise molle et la houle battait lourdement les écueils à quelques encablures du vaisseau. Mes regards restaient attachés sur Saint-Malo; je venais d'y laisser ma mère tout en larmes. J'apercevais les clochers et les dômes des églises où j'avais prié avec ma sœur Lucile, les murs, les remparts, les forts, les grèves, où j'avais passé mon enfance avec mes ca-

marades de jeux ; j'abandonnais ma patrie déchirée lorsqu'elle perdait un homme, Mirabeau, que rien ne pouvait remplacer. Je m'éloignais également incertain des destinées de mon pays et des miennes. Reverrais-je jamais cette France et ma famille ?—CHATEAUBRIAND.

2. Translate into French :—

(*a*) This house is not large enough for me, my family needs ten fair-sized rooms. Now this dining room is only fifteen feet long and twelve feet wide. We should have room enough on ordinary occasions when we should be alone, but if we happened to have a few friends on a visit to us, or, if we wished to invite some of our acquaintances to dinner, we should find it rather small.

(*b*) Pass me the butter, if you please. I beg your pardon for having interrupted your story. Will you not have the goodness to continue it? You have succeeded in interesting us all in the fortunes of your young man. Did he win the merchant's daughter, or was he told, as usually happens, to wait a year or two and endeavour to enlarge his income? I am burning with desire to know the end of the story.

(*c*) I should like very much to know why you have changed your mind concerning the expedition which we were to make together. There is just as much game in the woods as ever. The life in the open air is just as charming. You are only two months older, your character and tastes can hardly have changed in so short a time. What is the matter? There is evidently some reason for this that I know nothing about, and I wish you would tell me what it is.

B.

1. Give the primitive tenses of the following verbs :

Aller, boire, cuire, dire, écrire, faire, joindre, mourir, nuire, ouvrir, prendre, rire, savoir, tenir, vivre, voir.

2. Replace the nouns in italics by the proper pronouns :

Tous les serpents ne sont pas vénimeux ; il y a *des serpents* qui sont tout à fait inoffensifs.

L'argent ne fait pas le bonheur, mais il contribue *au bonheur*.

Si vous avez la santé, tâchez de conserver *votre santé*. Usez de la vie, n'abusez pas *de la vie*.

La Seine traverse Paris : Elle entre *dans Paris* à Charenton et elle sort *de Paris* à Auteuil.

3. Write a French composition of not less than one hundred and fifty words on domestic animals *or* the manner in which you spent last summer.

GERMAN.

ARTS, APPLIED SCIENCE, AND MEDICINE.

TUESDAY, SEPT. 19TH:—AFTERNOON, 2 TO 5.

I. Translate into English:—

Es trug sich zu, daß die Katze im Walde dem Herrn Fuchs begegnete; und weil sie dachte, er ist klug und wohlerfahren und gilt viel in der Welt, so sprach sie ihm freundlich zu: „Guten Tag, lieber Herr Fuchs, wie steht's? wie geht's? wie schlagt ihr euch durch in dieser teuern Zeit?" — Der Fuchs, alles Hochmuts voll, sah sie an von Kopf bis zu Fuß, und wußte lange nicht, ob er ihr etwas antworten sollte. Endlich sprach er: „O du armer Mäusejäger, was kömmt dir in den Sinn? Fragst du, ob mir's wohl gehe? und ich bin Herr über hundert Künste!" — Die Katze wollte ihm bescheiden antworten, aber in demselben Augenblicke kam ein Dachshund dahergelaufen. Wie der Fuchs den sah, machte er, daß er in seine Höhle kam; die Katze aber sprang behende auf eine Buche und setzte sich in den Gipfel, wo Äste und Laubwerk sie ganz verbargen. Bald kam der Jäger, und der Dachshund spürte den Fuchs und packte ihn. Als die Katze das sah, rief sie ihm hinab: „Ei, Herr Fuchs, seid ihr doch mit euren hundert Künsten stecken geblieben? Hättet ihr heraufklettern können, wie ich, so wär's nicht um euer Leben geschehen!"

2. Translate at sight:—

Translate:—

Friedrich der Große war einer der größten Herrscher, die der Welt je gesehen hat. Er war nicht nur ein kluger Staatsmann, sondern auch der größte Feldherr seiner Zeit. Er war ein sehr strenger, aber zugleich ein sehr gerechter König. Er regierte sein Reich als ob es sein eigenes Gut wäre; auch widmete er der Kunst und Wissenschaft viel Zeit. Die alles war ihm nur möglich, weil er seine Zeit sehr genau einteilte, und jede Stunde des Tages hatte ihre besondere Arbeit. Um vier Uhr des Morgens stand er auf; in wenigen Minuten hatte er sich ohne Hilfe angekleidet und dann

ging er an seinen Schreibtisch, auf welchem die in der Nacht angekommenen Briefe lagen. Die wichtigsten las er selbst und schrieb auch gewöhnlich an den Rand, was darauf zu antworten sei. Sobald die Briefe gelesen waren, trank er Kaffee und ging dann, die Flöte blasend, ein bis zwei Stunden im Zimmer auf und ab. Nachdem er die Flöte weglegte, traten dia Räte ein; und dann wurden die Briefe beantwortet. Wenn dies Geschäft zu Ende war, las er in einem Buche oder schrieb Briefe.

3. Translation at sight:—

Translate into German:—

(*a*) Come into this room where I am, bring your chair with you, shove that box into the corner and sit beside me. Let me see your face, if you please, I wish to be sure that you are listening; now I will tell you or read you a story. If I were more certain that my story would interest you, I should not ask you to sit where I can see you.

(*b*) The Boston train, you say, leaves Boston at half-past eight and arrives at a quarter to nine in the evening. My aunt is going to pay us a short visit, and I intend to meet her. She used to spend a month with us every year when she was younger, and nothing could have been more agreeable than those yearly visits, but now that she is older she dislikes the cold weather, and seldom stays more than a week.

(*c*) The largest towns do not lie on the banks of the largest rivers. London, Paris, Berlin and Rome are striking examples of the truth of what I have said. If, as all good Canadians hope and believe, Montreal becomes one day a world-city with millions of happy inhabitants for whom electricity will have rendered life easier and wholesomer, it will be a great exception.

(*d*) My father could have sold his house if he had been willing to accept a lower price. We have lived in the country for two years, and like it so much that we shall probably continue to spend our winters as well as our summers on our farm

(*e*) The students to whom these books belong do not study them diligently, which is a pity. (*f*) By means of a microscope living animals can be seen in a drop of water.

4. Grammar :—

Write the 1st and 2nd pers. sing. pres. ind. and the past participle of :—

trug, dachte, wuszte, sprach, verbargen, lagen, las.

PHYSIOGRAPHY.

ARTS.

WEDNESDAY, SEPT. 20TH :—MORNING 9 TO 10.30 A.M.

1. How is it that in the northern hemisphere summer is hotter than winter, though the sun is nearest the Earth in December?

2. State the composition of the atmosphere. Is there any difference in the percentage of Carbonic Acid in summer and winter, and, if so, why?

3. What is an *isothermal line*?

Sketch roughly the principal differences of climate met with on the 40th parallel of North Latitude, explaining the influence of large masses of land and water.

4. Describe an account for (*a*) the Trade Winds, (*b*) Land and Sea Breezes.

5. In North America a succession of areas of Low and High Pressure follow each other in an Easterly direction. Can you explain this? What kind of weather generally accompanies each?

6. Explain the formation of Tides. What are *Spring* and *Neap* Tides, and how are they caused?

7. How do you account for the existence of Mountain Ranges?

8. Explain the terms :—Geyser, Sargasso Sea, Moraine, Horse Latitudes.

BOTANY.

ARTS.

SEPTEMBER:—3 Hours.

1. Give a careful description of a plant of the Dicotyledonous type with respect to

(*a*) the structure of the flower;

(*b*) the venation;

(*c*) the stem structure.

Give an example.

2. Give a concise description of the pistil of an Angiospermous plant, and show how the pistil of the Gymnosperm differs.

3. Describe in full the structure and function of the stamen.

4. Select *one* of the following topics, and write upon it as fully as you can :—

(1) The way in which seeds are produced and the nature of the external influences which promote this process.

(2) The nature of plant food, and the way in which it is obtained from the soil.

(3) The relation of the atmosphere to plant nutrition and the influences under which such nutrition is carried on.

5. Select *one* of the following topics, and write as fully as you can :—

(1) The characteristics of the family Ranunculaceæ as illustrated by a selected example.

(2) The characteristics of the family Rosaceæ as illustrated by a selected example.

6. Give a concise account of the structure of the seed as found in (*a*) Dicotyledons, (*b*) Monocotolydons, and give an example of each.

7. Explain the application of the terms : gamopetalous, polysepalous, cohesion, adhesion, and give examples of each.

8. Give a full descriptive analyss of the specimen provided.

The examiner will please provide a specimen of any common wild flower, and forward a plant with the examination returns.

CHEMISTRY.

ARTS AND MEDICINE.

WEDNESDAY, SEPT. 20TH:—MORNING, 9 TO 12.

1. Give the laws of definite and multiple proportion with illustrations of each.

2. What do you understand by the terms Water of Crystallisation, Efflorescent, Deliquescent?

3. How can Nitrogen be obtained from the air by the use of Copper? What are its properties?

4. What takes place (*a*) when a piece of Sodium is thrown upon Water, and (*b*) when steam is passed over heated iron?

5. Compare Chlorine, Bromine and Iodine, giving their points of resemblance and difference.

6. In the preparation of Hydrochloric Acid if 50 grams of Common Salt are used, how much Sodium Sulphate will be obtained?

7. What is destructive distillation? From what kinds of substances is Ammonia given off in destructive distillation?

8. How may the composition of Water by weight be ascertained experimentally?

9. Express by means of equations the chemical changes that take place (*a*) when Manganese Dioxide is dissolved in Hydrochloric Acid, (*b*) when Iron Sulphide is dissolved in dilute Sulphuric Acid, (*c*) when Marble is dissolved in Nitric Acid.

10. What do you understand by the balance of an element? What is the balance of each of the following:—Sodium, Sulphur, Phosphorous, Carbon?

PHYSICS.

ARTS AND MEDICINE.

WEDNESDAY, SEPT. 20TH:—MORNING, 9 TO 10.30.

1. Describe instances of *malleability, adhesion, surface tension.*

2. Describe and explain the principle of the Hydrostatic Press.
If the diameter of the large cylinder is twelve times that of the

plunger, what force will be exerted by the press when a pressure of 16 lbs. is applied to the plunger?

3. A balloon, with its contents and car, weighs 3,000 lbs. and displaces 40,000 cubic feet of air. If a cubic foot of air weighs 1,293 ounces what is the force with which the balloon tries to rise?

4. A train of 120 tons mass, running at 30 miles an hour, is stopped by the brakes in one minute. What retarding force must the brakes have been exerting?

5. Describe in a few words each, the Specific Gravity Bottle, the Toggle-joint form of press, a method of proving experimentally Boyle's Law for the pressure of a gas at constant temperature.

6. Describe the Fahrenheit and Centigrade systems of graduating a thermometer, and prove a rule for converting Fahrenheit into Centigrade degrees.

7. Explain carefully what is meant by the statement that the Latent Heat of Steam is 536.

How is it that a draught of warm air feels cool, though the thermometer may show it to be upwards of 90° in temperature?

FACULTY OF ARTS.

FIRST YEAR EXHIBITIONS.

ἐγὼ γὰρ ὀκνοίην μὲν ἂν εἰς τὰ πλοῖα ἐμβαίνειν ἃ ἡμῖν δοίη μὴ ἡμᾶς ταῖς τριήρεσι καταδύσῃ, φοβοίμην δ' ἂν τῷ ἡγεμόνι ᾧ δοίη ἔπεσθαι, μὴ ἡμᾶς ἀγάγῃ ὅθεν οὐκ ἔσται ἐξελθεῖν. βουλοίμην δ' ἂν ἄκοντος ἀπιὼν Κύρου λαθεῖν αὐτὸν ἀπελθών.

(β) ὡς δὲ πορευομένων ἐξεκύμαινέ τι τῆς φάλαγγος, τὸ ὑπολειπόμενον ἤρξατο δρόμῳ θεῖν· καὶ ἅμα ἐφθέγξαντο πάντες οἷον τῷ Ἐνυαλίῳ ἐλελίζουσι, καὶ πάντες δὲ ἔθεον. πρὶν δὲ τόξευμα ἐξικνεῖσθαι ἐκκλίνουσιν οἱ βάρβαροι καὶ φεύγουσι. καὶ ἐνταῦθα δὴ ἐδίωκον μὲν κατὰ κράτος οἱ Ἕλληνες, ἐβόων δὲ ἀλλήλοις μὴ θεῖν δρόμῳ, ἀλλ' ἐν τάξα ἕπεσθαι.

A. (3) Xenophon, Hellenica I.

(α) Θρασύβουλος δὲ σὺν τριάκοντα ναυσὶν ἐπὶ Θράκης ᾤχετο, ἐκεῖ δὲ τά τε ἄλλα χωρία τὰ πρὸς Λακεδαιμονίους μεθεστηκότα κατεστρέψατο καὶ Θάσον, ἔχουσαν κακῶς ὑπό τε τῶν πολέμων καὶ στάσεων καὶ λιμοῦ. Θράσυλλος δὲ σὺν τῇ ἄλλῃ στρατιᾷ εἰς Ἀθήνας κατέπλευσε· πρὶν δὲ ἥκειν αὐτὸν οἱ Ἀθηναῖοι στρατηγοὺς εἵλοντο Ἀλκιβιάδην μὲν φεύγοντα καὶ Θρασύβουλον ἀπόντα. Κόνωνα δὲ τρίτον ἐκ τῶν οἴκοθεν.

(β) ἴστε δέ, ὦ ἄνδρες Ἀθηναῖοι, πάντες ὅτι τὸ Καννωνοῦ ψήφισμά ἐστιν ἰσχυρότατον, ὃ κελεύει, ἐάν τις τὸν τῶν Ἀθηναίων δῆμον ἀδικῇ, δεδεμένον ἀποδικεῖν ἐν τῷ δήμῳ, καὶ ἐὰν καταγνωσθῇ ἀδικεῖν, ἀποθανεῖν εἰς τὸ βάραθρον ἐμβληθέντα, τὰ δὲ χρήματα αὐτοῦ δημευθῆναι καὶ τῆς θεοῦ τὸ ἐπιδέκατον εἶναι.

B. (1) Homer, Odyssey XIII.

(*a*) κὰδ δ' ἄρ' Ὀδυσσῆι στόρεσαν ῥῆγός τε λίνον τε
νηὸς ἐπ' ἰκριόφι γλαφυρῆς, ἵνα νήγρετον εὕδοι,
πρυμνῆς· ἂν δὲ καὶ αὐτὸς ἐβήσετο καὶ κατέλεκτο
σιγῇ· τοὶ δὲ κάθιζον ἐπὶ κληῖσιν ἕκαστοι
κόσμῳ, πεῖσμα δ' ἔλυσαν ἀπὸ τρητοῖο λίθοιο. '
ἐνθ' οἱ ἀνακλινθέντες ἀνερρίπτουν ἅλα πηδῷ,
καὶ τῷ νήδυμος ὕπνος ἐπὶ βλεφάροισιν ἔπιπτε,
νήγρετος, ἥδιστος, θανάτῳ ἄγχιστα ἐοικώς.

(*β*) τὸν μὲν ἐγὼ κατιόντα βάλον χαλκήρεϊ δουρὶ
ἀγρόθεν, ἐγγὺς ὁδοῖο λοχησάμενος σὺν ἑταίρῳ·
νὺξ δὲ μάλα δνοφερὴ κάτεχ' οὐρανόν, οὐδέ τις ἡμέας
ἀνθρώπων ἐνόησε, λαθον δὲ ἑ θυμὸν ἀπούρας.
αὐτὰρ ἐπεὶ δὴ τόν γε κατέκτανον, ὀξέϊ χαλῷ,
αὐτίκ' ἐγὼν ἐπὶ νῆα κιὼν Φοίνικας ἀγαυοὺς
ἐλλισάμην, καὶ σφιν μενοεικέα ληίδα δῶκα.
τούς μ' ἐκέλευσα Πύλονδε καταστῆσαι καὶ ἐφέσσα
ἢ εἰς Ἦλιδα δῖαν, ὅθι κρατέουσιν Ἐπειοί.
ἀλλ' ἤτοί σφεας κεῖθεν ἀπώσατο ἴς ἀνέμοιο.

Write a note on scansion of last line.

B. (2) Homer, Odyssey VII.

(*a*) χάλκεοι μὲν γὰρ τοῖψοι ἐληλέδατ' ἔνθα καὶ ἔνθα,
ἐς μυχὸν ἐξ οὐδοῦ, περὶ δὲ θριγκὸς κυάνοιο·
χρύσειαι δὲ θύραι πυκινὸν δόμον ἐντὸς ἔεργον·
ἀργύρεοι δὲ σταθμοὶ ἐν οὐδῷ φαλκέῳ ἔσταν,
ἀργύρεον δ' ἐφ' ὑπερθύριον, χρυσέη δὲ κορώνη.
χρύσειοι δ' ἑκάτερθε καὶ ἀργύρεοι κύνες ἦσαν,
οὓς Ἥφαιστος ἔτευξεν ἰδυίῃσι πραπίδεσσι

δῶμα φυλασσέμεναι μεγαλήτορος Ἀλκινόοιο,
ἀθανάτους ὄντας καὶ ἀγήρως ἤματα πάντα.

Scan the fourth line.

(β) "ξεῖν', οὔ μοι τοιοῦτον ἐνὶ στήθεσσι φίλον κῆρ
μαψιδίως κεχολῶσθαι· ἀμείνω δ' αἴσιμα πάντα.
αἲ γὰρ, Ζεῦ τε πάτερ καὶ Ἀθηναίη καὶ Ἄπολλον,
τοῖος ἐὼν οἷός ἐσσι, τά τε φρονέων ἅ τ' ἐγώ περ,
παῖδά τ' ἐμὴν ἐχέμεν καὶ ἐμὸς γαμβροὺς καλέεσθαι
αὖθι μένων· οἶκον δέ κ' ἐγὼ καὶ κτήματα δοίην,
εἴ κ' ἐθέλων γε μένοις· ἀέκοντα δέ σ' οὔ τις ἐρύξει
Φαιήκων· μὴ τοῦτο φίλον Διὶ πατρὶ γένοιτο.

B. (3) Plato, Apology.

(α) μετὰ γὰρ τοὺς πολιτικοὺς ἦα ἐπὶ τοὺς ποιητὰς τούς τε τῶν τραγῳδιῶν καὶ τοὺς τῶν διθυράμβων καὶ τοὺς ἄλλους, ὡς ἐνταῦθα ἐπ' αὐτοφώρῳ καταληψόμενος ἐμαυτὸν ἀμαθέστερον ἐκείνων ὄντα. ἀναλαμβάνων οὖν αὐτῶν τὰ ποιήματα, ἅ μοι ἐδόκει μάλιστα πεπραγματεῦσθαι αὐτοῖς διηρώτων ἂν αὐτοὺς τί λέγοιεν, ἵν' ἅμα τι καὶ μανθάνοιμι πὰρ' αὐτῶν. αἰσχύνομαι οὖν ὑμῖν εἰπεῖν ὦ ἄνδρες, τἀληθῆ, ὅμως δέ ῥητέον. ὡς ἔπος γὰρ εἰπεῖν, ὀλιγοῦ αὐτῶν ἅπαντες οἱ παρόντες ἂν βέλτιον ἔλεγον περὶ ὧν αὐτοὶ ἐπεποιηκεσαν.

(β) πέπεισμαι ἐγὼ ἑκων εἶναι μηδένα ἀδικεῖν ἀνθρώπων ἀλλὰ ὑμᾶς τοῦτο οὐ πείθω· ὀλίγον γὰρ χρόνον ἀλλήλοις διειλέγμεθα· ἐπεί, ὡς ἐγῷμαι, εἰ ἦν ὑμῖν νόμος ὥσπερ καὶ ἄλλοις ἀνθρώποις, περὶ θανάτου μὴ μίαν ἡμέραν μόνον κρίνειν, ἀλλὰ πολλάς, ἐπείσθητε ἄν· γῦν δ' οὐ ῥάδιον ἐν χρόνῳ ὀλίγῳ μεγάλας διαβολὰς ἀπολύεσθαι.

C. (1) Euripides, Sidgwick's Scenes from Euripides, Hecuba.

(*a*) ἆρ' οἱ τεκόντες διαφέρουσιν ἢ τροφαί ;
ἔχει γε μέντοι καὶ τὸ θρεφθῆναι καλῶς
δίδαξιν ἐσθλοῦ· τοῦτο δ' ἤν τις εὖ μάθῃ,
οἶδεν τό γ' αἰσχρόν, κανόνι τοῦ καλοῦ μαθών.
καὶ ταῦτα μὲν δὴ νοῦς ἐτόξευσεν μάτην·
σὺ δ' ἐλθὲ καὶ σήμηνον Ἀργείοις τάδε.
μὴ θιγγάνειν μοι μηδὲν' ἀλλ εἴργειν ὄχλον
τῆς παιδός· ἔν τοι μυρίῳ στρατεύματι
ἀκόλαστος ὄχλος ναυτική τ' ἀναρχία
κρείσσων πυρός, κακὸς δ' ὁ μή τι δρῶν κακόν.

(*β*) κἆτ' ἐκ γαληνῶν πῶς δοκεῖς προσφθεγμάτων
εὐθὺς λαβοῦσαι φάσγαν' ἐκ πέπλων ποθὲν
κεντοῦσι παῖδας, αἱ δὲ πολεμίων δίκην
ξυναρπάσασαι τὰς ἐμὰς εἶχον χέρας
καὶ κῶλα· παισὶ δ' ἀρκέσαι χρῄζων ἐμοῖς
εἰ μὲν πρόσωπον ἐξανισταίην ἐμόν,
κόμης κατεῖχον, εἰ δὲ κινοίην χέρας,
πλήθει γυναικῶν οὐδὲν ἦνυον τάλας.

C. (2) Homer, Iliad VI.

(*a*) Γλαῦκος δ' Ἱππολόχοιο πάις καὶ Τυδέος υἱος
ἐς μέσον ἀμφοτέρων συνίτην μεμαῶτε μάχεσθαι.
οἱ δ' ὅτε δὴ σχεδὸν ἦσαν ἐπ' ἀλλήλοισιν ἴοντες,
τὸν πρότερος προσέειπε βοὴν ἀγαθὸς Διομήδης·
τίς δὲ σύ ἐσσι, φέριστε, καταθνητῶν ἀνθρώπων ;
οὐ μὲν γάρ ποτ' ὄπωπα μάχῃ ἔνι κυδιανείρῃ
τὸ πρίν· ἀπὰρ μὲν νῦν γε πολὺ προβέβηκας ἁπάντων
σῷ θάρσει, ὅ τ' ἐμόν δολιχίσκιον ἔγχος ἔμεινας.

Scan the first line.

(β) δαιμονίη, μή μοί τι λίην ἀκαχίζεο θυμῷ.
οὐ γάρ τίς μ' ὑπὲρ αἶσαν ἀνὴρ Ἄιδι προιάψει·
μοῖραν δ' οὔ τινά φημι πεφυγμένον ἔμμεναι ἀνδρῶν,
οὐ κακόν, οὐδὲ μὲν ἐσθλόν, ἐπὴν τὰ πρῶτα γένηται
ἀλλ' εἰς οἶκον ἰοῦσα τὰ σ' αὐτῆς ἔργα κόμιζε,
ἱστόν τ' ἠλακάτην τε καὶ ἀμφιπόλοισι κέλευε
ἔργον ἐποίχεσθαι· πόλεμος δ' ἄνδρεσσι μελήσει
πᾶσιν, ἐμοὶ δὲ μάλιστα, τοὶ Ἰλίῳ ἐγγεγάασιν.

C. (3) Homer, Iliad IV.

(α) αὐτίκ' ἐσύλα τόξον ἐύξοον ἰξάλου αἰγὸς
ἀγρίου, ὅν ῥά ποτ' αὐτὸς ὑπὸ στέρνοιο τυχήσας
πέτρης ἐκβαίνοντα, δεδεγμένος ἐν προδοκῇσιν,
βεβλήκει πρὸς στῆθος· ὁ δ' ὕπτιος ἔμπεσε πέτρῃ·
τοῦ κέρα ἐκ κεφαλῆς ἐκκαιδεκάδωρα πεφύκειν·
καὶ τὰ μὲν ἀσκήσας κεραοξόος ἤραρε τεκτων
πᾶν δ' εὖ λειήνας χρυσέην ἐπέθηκε κορώνην.
καὶ τὸ μὲν εὖ κατέθηκε τανυσσάμενος ποτὶ γαίῃ
ἀγκλίνας· πρόσθεν δὲ σάκεα σχέθον ἐσθλοὶ ἑταῖροι,
μὴ πρὶν ἀναΐξειαν ἀρήιοι υἷες Ἀχαιῶν,
πρὶν βλῆσθαι Μενελαον ἀρήιον Ἀτρέος υἱόν.

Scan the ninth line.

(β) τὸν δὲ πεσόντα ποδῶν ἕλαβε κρείων Ἐλεφήνωρ
Χαλκωδροντιάδης, μεγαθύμων ἀρχὸς Ἀβάντων,
ἕλκε δ' ὑπὲκ βελέων λελιημένος ὄφρα τάχιστα
τεύχεα συλήσειε· μίνυνθα δέ οἱ γένετ' ὁρμή.
νεκρὸν γὰρ ἐρύοντα ἰδὼν μεγάθυμος Ἀγήνωρ
πλευρά, τά οἱ κύψαντι πάρ' ἀσπίδος ἐξεφαάνθη
οὔτησε ξυστῷ χαλκήρει, λῦσε δὲ γυῖα.

C. (4) Plato, Crito.

(*a*) ἐλέγετο δέ πως, ὡς ἐγῷμαι, ἑκάστοτε ὧδε ὑπὸ τῶν οἰομένων τι λέγειν, ὥσπερ νῦν δὴ ἐγὼ ἔλεγον, ὅτι τῶν δοξῶν, ἃς οἱ ἄνθρωποι δοξάζουσι, δέοι τὰς μὲν περὶ πολλοῦ ποιεῖσθαι, τὰς δὲ μή. τοῦτο πρὸς θεῶν, ὦ Κρίτων, οὐ δοκεῖ καλῶς σοι λέγεσθαι; σὺ γάρ, ὅσα γε ἀνθρώπεια, ἐκτὸς εἰ τοῦ μέλλειν ἀποθνήσκειν αὔριον, καὶ οὐκ ἂν παρακρούοι σε ἡ παροῦσα ξυμφορά.

(*β*) οὐδ' ἐπιθυμία σε ἄλλης πόλεως οὐδ' ἄλλων νόμων ἔλαβεν εἰδέναι, ἀλλὰ ἡμεῖς σοι ἱκανοὶ ἦμεν καὶ ἡ ἡμετέρα πόλις· οὕτω σφόδρα ἡμᾶς ἡροῦ, καὶ ὡμολόγεις καθ' ἡμᾶς πολιτεύεσθαι, τά τε ἄλλα καὶ παῖδας ἐν αὐτῇ ἐποιήσω, ὡς ἀρεσκούσης σοι τῆς πόλεως. ἔτι τοίνυν ἐν αὐτῇ τῇ δίκῃ ἐνῆν σοι φυγῆς τιμήσασθαι, εἰ ἐβούλου, καὶ ὅπερ νῦν ἀκούσης τῆς πόλεως ἐπιχειρεῖς, τότε ἑκούσης ποιῆσαι.

SIGHT TRANSLATION AND COMPOSITION.

THURSDAY, SEPTEMBER 21ST :—9 TO 11 A.M.

(Alternative paper for Candidates who do not offer set Books).

B.

1. Translate into English :

καὶ τὸν ἡγεμόνα δήσαντες παραδιδόασιν αὐτοῖς, καὶ συντίθενται τὴν μὲν νύκτα, ἣν λάβωσι τὸ ἄκρον, τὸ χωρίον φυλάττειν, ἅμα δὲ τῇ ἡμέρᾳ τῇ σάλπιγγι σημαίνειν· καὶ τοὺς μὲν ἄνω ὄντας ἰέναι ἐπὶ τοὺς κατέχοντας τὴν φανερὰν ἔκβασιν, αὐτοὶ δὲ συμβοηθήσειν ἐκβαίνοντες ὡς ἂν δυνωνται τάχιστα. ταῦτα συνθέμενοι οἱ μὲν ἐπορεύοντο πλῆθος

ὡς δισχίλιοι. καὶ ὕδωρ πολὺ ἦν ἐξ οὐρανοῦ. Ξενοφῶν δ ἔχων τοὺς ἄλλους ἡγεῖτο πρὸς τὴν φανερὰν ἔκβασιν.

2. Translate into Greek :

(*a*) The king has more soldiers than Cyrus.

(*b*) Our generals did not conquer the enemy.

(*c*) Those who fight are wiser than those who fly.

(*d*) The ships themselves were captured on the same day.

(*e*) After this battle they remained there three days.

(*f*) They marched past the city, saying that they had conquered.

(*g*) He came with all speed, in order to save the Greeks.

(*h*) Having killed two thousand men, they captured the rest alive.

GREEK.

SIGHT TRANSLATION.

THURSDAY, SEPTEMBER 21ST :—11 TO 12 A.M.

C.

ἔπειτα δὲ ἀναμνήσω ὑμᾶς καὶ τοὺς τῶν προγόνων τῶν ἡμετέρων κινδύνους, ἵνα εἰδῆτε ὡς ἀγαθοῖς τε ὑμῖν προσήκει εἶναι καὶ σώζονται ἀεὶ οἱ ἀγαθοί. Ξέρξης γὰρ συλλέξας πολλὴν στρατίαν ἦλθεν ἐπὶ τὴν Ἑλλάδα. οἱ δὲ ἡμέτεροι πρόγονοι τότε ἐνίκων τοὺς τούτων προγόνους καὶ κατὰ γῆν καὶ κατὰ θάλασσαν. ὥστε ἐκ τούτων ἔξεστιν εἰδέναι ὅτι σώσουσι καὶ ἡμᾶς οἱ θεοί, ἐὰν ἐθέλωσιν, καὶ ἐκ τῶν νῦν κινδύνων.

GREEK GRAMMAR, COMPOSITION, HIGHER COMPOSITION AND HIGHER SIGHT TRANSLATION.

THURSDAY, SEPT. 21ST, 1899—AFTERNOON, 2 TO 5.

A.—GREEK GRAMMAR.

(1) Give Accusative Singular and Dative Plural of — *ναῦς*, *νοῦς*, *ὀδούς*, *λεώς*, *οὗτος* (all genders), *μέγας* (all genders), *πολύς* (all genders), *μείζων* (all genders).

(2) Give 2nd Sing. Aor. Ind. Act. ; Dat. Plur. Fem. Perf. Part. Act. ; 3rd. Sing. Aor. Opt. Pass. ; 1st Plur. Fut. Ind. Act. ; 2nd Plur. Aor. Imp. Middle ; 3rd Sing. Pres. Subj. Act. ; of *αἱρέω*, *καθίστημι*, *γιγνώσκω*, *λαμβάνω*.

(3) Give the usages of *ἐπί*, *μετά*, *κατά*, *παρὰ*.

(4) State the ways of expressing Purpose and Consequence.

B.—GREEK COMPOSITION.

(1) The general led his own army to the city.

(2) Those who had been conquered were all killed.

(3) He captured four ships, men and all.

(4) On the same day he persuaded the Greeks themselves to follow.

(5) They went to Cyrus to announce that those present were willing to fight.

(6) If the Lacedaemonians had killed these men, they would have greatly injured Athens.

C.—HIGHER COMPOSITION.

A certain rich man had two sons, one wiser in regard to money, the other dearer to the father. So when he was

about to die, he did not know to whom he should give his poperty. For he thought that the one would spend it, and that the other would save it so that it would not be of use to anyone. So at last he left it to the one, on condition that he should give the income (*πρόσοδος*) to the other.

D.—HIGHER TRANSLATION AT SIGHT.

ἐνταῦθα καὶ οἱ περὶ Ξενοφῶντα ηὐλίσθησαν αὐτοῦ ἄνευ πυρὸς καὶ ἄδειπνοι. φυλακὰς οἵας ἐδύναντο καταστησάμενοι. ἐπεὶ δὲ πρὸς ἡμέραν ἦν, ὁ μὲν Ξενοφων πέμψας πρὸς τοὺς ἀσθενοῦντας τοὺς νεωτάτους ἀναστήσαντας ἐκέλευεν ἀναγκάζειν προϊέναι. ἐν δὲ τούτῳ Χειρίσοφος πέμπει τῶν ἐκ τῆς κώμης σκεψομένους πῶς ἔχοιεν οἱ τελευταῖοι. οἱ δὲ ἄσμενοι ἰδόντες τοὺς μὲν ἀσθενοῦντας τούτοις παρέδοσαν κομίζειν ἐπὶ τὸ στρατόπεδον, αὐτοὶ δὲ ἐπορεύοντο, καὶ πρὶν εἴκοσι στάδια διεληλυθέναι ἦσαν πρὸς τῇ κώμῃ ἔνθα Χειρίσοφος ηὐλίζετο.

LATIN BOOKS.

THURSDAY, SEPTEMBER 14TH :—9 TO 11.

NOTE.—In each question candidates will not get credit for more than one of the pieces numbered A, B, C, D.

1. A. Ariovistum se consule cupidissime populi Romani amicitiam adpetisse : cur hunc tam temere quisquam ab officio discressurum iudicaret? sibi quidem persuaderi, cognitis suis postulatis atque aequitate condicio num perspecta eum neque suam neque populi Romani gratiam repudiatu rum. quod si furore atque amentia impulsus bellum intulisset, quid tandem vererentur? aut cur de sua virtute aut de ipsius diligentia desperarent? factum eius hostis periculum patrum nostrorum memoria, cum Cimbris et Teutonis a Gaio Mario pulsis non minorem laudem exercitus quam ipse imperator meritus videbatur : factum etiam nuper in Italia servili tumultu, quos tamen aliquid usus ac disciplina, quam a no bis accepissent, sublevarent.

1. B. Magnum ibi numerum versuum ediscere dicuntur itaque annos nonnulli viginti in disciplina permanent. neque fas esse existimant ea-

illteris mandare, cum in reliquis fere rebus, publicis privatisque rationibus Graecis litteris utantur. id mihi duabus de causis instituisse videntur, quod neque in vulcum disciplinam efferri velint neque eos, qui discunt, litteris confisos minus memoriae studere ; quod fere plerisque accidit, ut praesidio litterarum diligentiam in perdiscendo ac memoriam remittant. imprimis hoc volunt persuadere, non interire animas, sed ab aliis post mortem transire ad alios. atque hoc maxime ad virtutem excitari putant, metu mortis neglecto. multa praeterea de sideribus atque eorum mortu de mundi ac terrarum magnitudine, de rerum natura, de deorum immortalium vi ac potestate disputant et iuventuti tradunt.

C. Quoties causas belli et necessitatem nostram intueor, magnus mih animus est, hodiernum diem, consensumque vestrum, initium libertatis totius Britanniae fore. nam et universi servitatis expertes et nullae ultra terrae, ac ne mare quidem securum, imminente nobis classe Romana. ita proelium atque arma, quae fortibus honesta, eadem etiam ignavis tutissima sunt. priores pugnae, quibus adversus Romanos varia fortuna certatum est, spem ac subsidium in nostris manibus habebant : quia nobilissimi totius Britanniae, eoque in ipsis penetralibus site, nec servientium litora adspicientes, oculos quoque a contactu dominationis inviolatos habemus. Nos terrarum ac libertatis extremos, recessus ipse ac sinus famae in hunc diem defendit.

2. A. Se quoque principibus permixtum adgnovit Achivis,
eoasque acies et nigri Memnonis arma.
ducit Amazonidum lunatis agmina peltis
Penthesilea furens mediisque in milibus ardet,
aurea subnectens exertae cingula mammae,
bellatrix, audetque viris concurrere virgo.
haec dum Dardanio Aeneae miranda videntur,
dum stupet optutuque haeret defixus in uno,
regina ad templum, forma pulcerrima Dido,
incessit magna invenum comitante caterva
qualis in Eurotae ripis aut per iuga Cynthi
exercet Diana choros, quam mille secutae
hinc atque hinc glomerantur Oreades : illa pharetram
fert umero, gradiensque deas supereminet omnes ;
Latonae tacitum pertemptant gaudia pectus ;
talis erat Dido, talem se laeta ferebat
per medios, instans operi regnisque futuris.

2. B. Post ubi confecti cursus, et dona peregit :
'nunc, sicui virtus animusque in pectore praesens,
adsit et evinctis attollat braechia palmis.'
sic ait et geminum pugnae proponit honorem,
victori velatum auro vittisque iuvencum,

ensem atque insignem galeam solacia victo.
nec mora: continuo vastis cum viribus effert
ora Dares magnoque virum se murmure tollit,
solus qui Paridem solitus contendere contra,
idemque ad tumulum, quo maximus occubat Hector,
victorem Buten immani corpore, qui se
Belrycia veniens Amyci de gente ferebat,
perculit et fulva moribundum extendit harena.
talis prima Dares caput altum in proelia tollit,
ostenditque umeros latos alternaque iactat
bracchia protendens et verberat ictibus auras.

2. C. Quae contra breviter fata est Amphrysia vates:
nullae hic insidiae tales (absiste moveri),
nec vim tela ferunt: licet ingens ianitor antro
aeternum latrans exsangues terreat umbras,
casta licet patrui servet Proserpina limen.
Troius Aeneas, pietate insignis et armis,
ad genitorem imas Erebi descendit ad umbras.
si te nulla movet tantae pietatis imago,
at ramum hunc (aperit ramum qui veste latebat)
adgnoscas. tumida ex ira tum corda residunt,
nec plura his: ille admirans venerabile donum
fatalis virgae, longo post tempore visum,
caeruleam advertit puppim ripaeque propinquat.
inde alias animas, quae per iuga longa sedebant,
deturbat laxatque foros: simul accipit alveo
ingentem Aenean.

3. A. Sed tu ut vitiis tuis commoveare, ut legum poenas pertimescas, ut temporibus rei publicae cedas, non est postulandum. neque enim is es, Catilina, ut te aut pudor unquam a turpitudine aut metus a periculo aut ratio a furore revocaverit. quam ob rem, ut saepe iam dixi, proficiscere, ac, si mihi inimico, ut praedicas, tuo conflare vis invidiam, recta perge in exilium: vix feram sermones hominum, si id feceris, vix molem istius invidiae, si in exilium iussu consulis ieris sustinebo. Sin autem servire meae laudi et gloriae mavis, egredere cum importuna sceleratorum manu, confer te ad Maulium, concita perditos cives, secerne te a bonis, infer patriae bellum, exsulta impio latrocinio, ut a me non eiectus ad alienos sed invitatus ad tuos esse videaris. Quamquam quid ego te invitem, a quo iam sciam esse praemissos, qui tibi ad Forum Aurelium praestolarentur armati?

3. B. Etenim quaero, si quis pater familias, liberis suis a servo interfectis, uxore occisa, incensa domo, supplicium de servo non quam acerbissimum sumpserit, utrum is clemens ac misericors an inhumanissimus et

crudelissimus esse videatur ? mihi vero importunus ac ferreus, qui non dolore et cruciatu nocentis suum dolorem cruciatumque lenierit. Sic nos in his hominibus, qui nos, qui coniuges, qui liberos nostros trucidare voluerunt, qui singulas unius cuiusque nostrum domos et hoc universum rei publicae domicilium delere conati sunt, qui id egerunt, ut gentem Allobrogum in vestigus huius urbis atque in cinere deflagrati imperii collocarent, si vehementissimi fuerimus, misericordes habebimur: sin remissores esse voluerimus, summae nobis crudelitatis subeunda est.

3. C. Vide, quam sit varia vitae commutabilisque ratio, quam vaga volubilisque fortuna, quantae infidelitates in amicitiis, quam ad tempus aptae simulationes, quantae in periculis fugae proximorum, quantae timiditates. erit erit illad profecto tempus et illucescet ille aliquando dies, cum tu salutaribus, ut spero, rebus tuis, sed fortasse motu aliquo communium temporum, qui quam crebro accidat experti scire debemus, et amicissimi benevolentiam et gravissimi hominis fidem et unius post homines natos fortissimi vivi magnitudinem animi desideres. quamquam quis hoc credat, Cn. Pompeium, iuris publici, moris maiorum, rei denique publicae peritissimum, cum senatus ei commiserit, ut videret ne quid res publica detrimenti caperet, quo uno versiculo satis armati semper consules fuerunt etiam nullis armis datis, hunc exercitu hunc dilectu dato iudicium exspectaturum fuisse in eius consiliis vindicandis, qui vi iudicia ipsa tolleret ?

3. D. Quis desiderio sit pudor aut modus
tam cari capitis ? praecipe lugubres
cantus, Melpomene, cui liquidam pater
vocem cum cithara dedit.
ergo Quintilium perpetuus sopor
urget ! cui Pudor et justitiae soror,
incorrupta Fides, nudaque veritas
quando ullum inveniet parem ?
multis ille bonis flebilis occidit,
nulli flebilior quam tibi, Virgili.
tu frustra pius heu non ita creditum
poscis Quintilium deos.
quid si Threicio blandius Orpheo
auditam moderere arboribus fidem,
num vanae redeat sanguis imagini,
quam uirga semel horrida,
non lenis precibus fata recludere,
nigro compulerit Mercurius gregi ?
durum : sed levius fit patientia,
quidquid corrigere est nefas.

LATIN.

SEPT. 14 :—11 TO 12 A.M.

FOR UNSEEN TRANSLATION.

Vivet Maeonides, Tenedos dum stabit et Ide,
dum rapidas Simois in mare volvet aquas.
Vivet et Ascraeus, dum mustis uva tumebit,
dum cadet incurva falce resecta Ceres.
Battiades semper toto cantabitur orbe:
quamvis ingenio non valet, arte valet.
nulla Sophocleo veniet iactura cothurno;
cum sole et Luna semper Aratus erit.
Ennius arte carens, animosique Accius oris,
casurum nullo tempore nomen habent.
Varronem primanque ratem quae nesciat aetas,
aureaque Aesonio terga petita duci?
Carmina sublimis tum sunt peritura Lucreti,
exitio terras cum dabit una dies.
Tityrus et fruges Aeneiaque arma legentur
Roma triumphati dum caput orbis erit.

LATIN COMPOSITION AND GRAMMAR.

THURSDAY, SEPTEMBER 14TH :—2 TO 5 P.M.

NOTE.—Question 3 only to be attempted by Students who take Higher Composition.

1. Translate :-

(*a*) How much did you give for your horse?

(*b*) He died at Tarentum, Sept. 8th, 55 B.C.

(*c*) He asked me why I set out with my brother to Rome.

(*d*) Tell him to come at once.

(*e*) He said that he lived in the street which was called the Street of the Tuscans.

(*f*) He repents of his folly.

(*g*) We ought to spare the conquered.

(*h*) It is not every one who has time for study.

2. (*a*) Decline iudex, senex, dies, niger, tristis.

(*b*) Latin for two camps, 700 wars, 70 wars, 2,000 men.

(*c*) Decline ille, ego, idem, quidam.

(*d*) Fut. Indic. Act. of rego, Fut. Inf. Pass. of moneo,
Perf. Inf. Pass. of audeo, Perf. Ind. Act. of amo,
Fut. Inf. of proficiscor, Pres. Inf. Pass. of rapio, Imp. Subj. of morior.

(*e*) Parts of seco, tego, lego, negligo, ulciscor, reperio peto.

(*f*) Rule for expressing 'at a town' and Price. What verbs take an Ablative?

3. Translate :—

The vessel bearing back the exiled Augustus sailed along the northern coast of the Euxine, and somewhere between the mouths of the Dviestr and the Dniepr it was caught in a storm. The crew despaired. One of his attendants said to the emperor, "Lo now, my lord, we perish. Make a compact with God for your safety, that, if he restore your sovereignty, you will take vengeance on none of your enemies." But Justinian answered angrily, "If I spare a single one of them, may God drown me here." And they came safely forth from the storm and reached the Danube.

GEOMETRY—ARITHMETIC.

FRIDAY, SEPT. 15TH :—MORNING, 9 TO 12.

A

1. To a given straight line, apply a parallelogram which shall be equal to a given triangle and have one of its angles equal to a given angle.

2. If a straight line be divided into any two parts, the sum of the squares of the whole line and of one of the parts is equal to twice the rectangle under the whole line and that part, together with the square of the other part.

3. In any triangle, the square on the side subtending an acute angle is less than the sum of the squares of the sides containing the angle by twice the rectangle under either of the sides and the intercept on it between the acute angle and the perpendicular let fall on it from the opposite angle.

(*a*) In any triangle the sum of the squares of the sides is equal to twice the square of half the base together with twice the square of the line joining the vertex to the middle point of the base.

4. Angles in the same segment of a circle are equal to one another.

5. If a tangent be drawn to a circle, and from the point of contact a chord be drawn, the angles which the cord makes with the tanget are equal to the angles in the alternate segments of the circle.

a. Two circles touch each other externally, prove that any line drawn through the point of contact cutting the circles cuts off similar segments from the two circles.

6. Extract the square root of 13704804.

7. Divide $27,200 among three persons in shares proportional to the numbers 8, 5, 3.

8. From the sum of $3\frac{1}{2}+2\frac{1}{4}-1\frac{1}{8}$ subtract the half of $1\frac{1}{8}$; multiply the remainder by 1.06 and divide the product by 3.124.

9. Express in kilogrammes the weight of a beam of wood which is 4 m 45cm. long, 24cm. broad and 20cm. thick, assuming that the wood weighs 55 times as much as an equal bulk of water.

B.

10. Inscribe a regular pentagon in a given circle.

a. All the diagonals of a regular pentagon intersect so as to form another regular pentagon.

11. Find a mean proportional between two given straight lines.

a. If two circles touch each other, and also touch a given straight line, the part of the common tangent between the points of contact is a mean proportional between the diameters of the circles.

12. Triangles of equal area, which have one angle of the one equal to one angle of the other, have their sides about the equal angles reciprocally proportional.

13. If three straight lines be proportionals, the rectangle contained by the extremes is equal to the square of the mean.

ALGEBRA.

FRIDAY, SEPTEMBER 15TH:—AFTERNOON, 2 TO 5.

A.

1. Find the factor of (1) x^3-4x^2+4x, (2) x^3-27y^3, (3) $2x^2-5x+2$, (4) x^3-x^2+x-1.

2. Simplify the following:

(1) $\dfrac{x^4 + a^2 x^2 + a^4}{x^4 + a x^3 - a^3 x - a^4}$,

(2) $1 + \dfrac{a}{x-a} + \dfrac{b x}{(x-a)(x-b)} + \dfrac{c x}{(x-a)(x-b)(x-c)}$.

3. Solve the equations:

(1) $\dfrac{x+4}{x-1} - \dfrac{x-3}{x+3} = \dfrac{7}{2}$,

(2) $(x-a)^3 + (x-b)^3 + (x-c)^3 = 3(x-a)(x-b)(x-c)$,

(3) $\sqrt{x+3} + \sqrt{x+8} = 5\sqrt{x}$,

(4) $\begin{cases} cy + \quad = bc, \\ az + cx = ca, \\ bx + ay = ab. \end{cases}$

4. Solve the general quadratic $ax^2 + bx + c = 0$ and show

(1) that the sum of the roots $= -\dfrac{b}{a}$,

(2) that the product of the roots $= \dfrac{c}{a}$,

(3) that the square of the difference of the roots $= \left(\dfrac{b}{a}\right)^2 - 4\dfrac{c}{a}$

(4) that $a^2 + 4ac - b^2 = 0$ if the roots are two successive integers.

5. Simplify $\dfrac{1}{(2+\sqrt{3})^2} + \dfrac{1}{(2-\sqrt{3})^2}$.

B.

6. Determine a formula for finding the sum of any number of terms of an Arithmetical Progression. When 29 arithmetical means are inserted between 5 and 69, what is the common difference?

7. How many words can be made by using all the letters of the work abracadabra

8. Express the common logarithms of 1·5, 4·8, 7·5 in terms of the common logarithms of 2 and 3.

9. Prove that any number expressed in the scale of r is divisible by $r - 1$ if the sum of its digits is divisible by $r - 1$.

TRIGONOMETRY.

10. State and prove the rule for changing an angle from circular (radian) measure to degrees or seconds.

11. Make two positive unequal angles whose sines are each $\frac{2}{3}$. Find the cosines of these angles.

12. Write down the signs and numerical values of the following: sin 45°, cos 135°, sin 210°, tan 225°.

13. Prove that

(1) $\sec^2 A = 1 + \tan^2 A$,

(2) $(\sec A - \tan A)^2 = \dfrac{1 - \sin A}{1 + \sin A}$,

(3) $\sin (A - B) = \sin A \cos B - \cos A \sin B$,

(4) $\tan (A - B) = \dfrac{\tan A - \tan B}{1 + \tan A \tan B}$,

(5) $\dfrac{\tan A - \tan B}{\tan A + \tan B} = \dfrac{\sin (A - B)}{\sin (A + B)}$.

14. Given $\sin A = \frac{2}{3}$, show that $\sin 2A = \pm \frac{4}{9}\sqrt{5}$, $\cos 2A = \frac{1}{9}$.

When is $\sin 2A$ plus? when minus?

ENGLISH GRAMMAR.

MONDAY, SEPT. 18TH:—9-12 A.M.

(Candidates will answer questions 1, 2, 3, 5, 8, 9, 10 of the First Year Entrance Paper and also the following):—

1. State and illustrate Grimm's and Verner's Laws.

2. State what you know concerning the three leading Early English Dialects.

3. Give the etymology of the following words: aunt, queen, lord, sir. Explain the plurals: *children*, *deer*; the forms *farther*, *as naught*, *yes*.

4. Examine historically the personal inflexions of the English verb. Add a note on the verbal suffix *ing*.

MONDAY, SEPT. 18TH :—2-6 p.m.

Candidates will answer A and B OR *A and C of the First Year Entrance Paper in separate books and also the following paper in a separate book.*

MILTON : *L'Allegro and other poems.*

1. How does Milton speak of

(*a*) Shakespere's facility in composition ?

(*b*) Hobson's "latest inn ?"

(*c*) the Marchioness of Winchester as a "Bright Saint ?"

2. Write a paragraph of fifteen or twenty lines on L'Allegro and Il Penseroso, bringing out their parallelism and their contrast.

3. Give the meaning of the following epithets in L'Allegro and Il Penseroso : wanton, unreproved, secure, lubber, decent, profaner, massy kerchieft. Add its noun to each.

Explain : Orpheus, Jonson's sock, Prince Memnon's sister, thrice great Hermes, Pelops' line. Say with precision where each occurs.

4. State the occasion for which Arcades was written. Notice the more minute references to Arcadia in the poem.

5. Give in a few lines your impression of Lycidas. Briefly notice its construction.

Quote or give the substance of :

(*a*) The passage on Fame.

(*b*) The passage on the flowers for Lycid's hearse.

6. Give a list of the personal sonnets of Milton other than those referring directly to himself, and quote or give the substance of a leading thought from each.

MACAULAY'S ESSAYS on *Ranke, Frederic the Great, and Dumont's Mirabeau.*

WEDNESDAY, SEPTEMBER 20TH :—2-4.30 P.M.

(Do not write on Question 5 unless time remains after the other questions are answered.)

1. What does Macaulay say concerning,

(*a*) the Albigensian heresy ;

(*b*) the movement which is connected with the name of Voltaire ?

2. (*a*) "Such was Frederic the Ruler. But there was another Frederic, the Frederic of Rheinsberg, the fiddler and flute-player, the poetaster and metaphysician." Develop the contrast which is indicated in this passage.

(*b*) Explain the circumstances of the battle of Rossbach and estimate its effect.

3. (*a*) How does Macaulay regard Louis XIV?

(*b*) Contrast the English with the French spirit in regard to political revolution.

4. Make brief notes on: the Pragmatic Sanction, Frederic the Great's father, the New Zealander on London Bridge, the Jesuits, the character of Mirabeau's eloquence.

5. What main features of style have impressed you in reading Macaulay?

Candidates who offer Macaulay's Essay on *The Pilgrim's Progress* will substitute the following Question for Question 1 of the ordinary paper.

1. (*a*) Contrast briefly allegory in *The Pilgrim's Progress* with allegory elsewhere.

(*b*) "The Pilgrim's Progress undoubtedly is not a perfect allegory." Substantiate.

(*c*) "Some characters and scenes in the Pilgrim's Progress can be fully comprehended and enjoyed only by persons familiar with the history of the times through which Bunyan lived."

ENGLISH COMPOSITION.

WEDNESDAY, SEPTEMBER 20TH:—4.30-6 P. M.

Write an essay of not less than *three* pages on any *one* of the following subjects:—

The spirit of Milton's *L'Allegro*.

A Summary of Macaulay's conclusion concerning the Character of Frederick the Great.

The Leading Qualities of Macaulay's Language.

ENGLISH LITERATURE.

FRIDAY, SEPTEMBER 22ND:—2-4 P. M.

MORLEY:—*First Sketch*, Chaps. VII. and VIII.

1. Make a list of the chief Elizabethan translations with the names of their authors.

2. Give a short account of "Euphues" and its author.

3. State the chief works of the following authors, and briefly indicate their character:—Richard Hooker, Joseph Hall, Michael Drayton, Henry Constable, Samuel Daniel, Richard Lovelace.

4. Sketch the life of Sir Walter Raleigh.

5. Name the works of Milton published before the Commonwealth.

FRENCH.

TUESDAY, SEPTEMBER 19TH, 1899:—MORNING, 9 TO 12.

A.

1. Traduire les passages suivants:

(*a*) Je ne crois pas qu'il y ait dans l'histoire quelque chose de plus extraordinaire que l'épisode de cet évêque d'Agra, qui suivait l'armée Vendéenne, bénissant les étendards, les pièces d'artillerie, chantant le *Te Deum*.

Tout à coup on apprend par une mystérieuse lettre du Pape que l'évêque est un imposteur, inconnu au bataillon de l'Eglise.

Comment faire? un éclat? les chefs n'osent pas, qu'auraient dit les paysans? puis se priver de cette influence?

Et l'évêque a continué à suivre l'armée, à bénir, à pontifier, confirmer, un peu triste, mais résigné, sentant bien qu'il était découvert, car les généraux et les prêtres lui parlaient à peine, obligés toutefois à lui rendre les honneurs publiquement. A. DAUDET.

(*b*) Ce qui demeure, c'est l'esprit français, dans le sens large du mot, ce grand souffle ironique ou gai répandu sur notre peuple depuis qu'il pense et qu'il parle; c'est la verve terrible de Montaigue et Rabelais, l'ironie de Voltaire, de Beaumarchais, de Saint-Simon, et le prodigieux rire de Molière.

La saillie, le mot est la monnaie très menue de cet esprit-là. Et pourtant c'est encore un côté, un caractère tout particulier de notre intelligence nationale. C'est un de ses charmes les plus vifs. Il fait la gaité sceptique de notre vie parisienne, l'insouciance aimable de nos mœurs. Il est une partie de notre aménité.—GUY DE MAUPASSANT.

2. Traduire en français:

(*a*) The Americans have delivered Cuba from the Spanish yoke, and are endeavouring at the present time to subdue the Filipinos. They fight with the same valour as in the Cuban war, but victory is less prompt in declaring itself on their side. A great number of the better class of American citizens are opposed to this war. They say that it is unworthy of a land of liberty to deprive any people of the opportunity to arrive at its independence. College professors are frequently to be found thundering against the government. It cannot be denied, however, that many conscientious people approve of the efforts which President McKinley is making to restore order and tranquility in that unhappy land.

(*b*) Nothing in the early existence of Britain indicated the greatness which she was destined to gain. She was subjugated by Roman arms; but she received only a faint tincture of Roman arts and letters. No magnificent remains of Latian porches and aqueducts are to be found in

Britain. No writer of British birth is reckoned among the masters of Latian poetry and eloquence. It is not probable that the islanders were at any time generally familiar with the tongue of their Italian rulers. From the Atlantic to the vicinity of the Rhine, the Latin has been predominant and is at this day the basis of the French, Spanish and Portuguese languages. In our Island, the Latin appears never to have superseded the old Gallic speech and could not stand its ground against the Anglo-saxon.

(MACAULAY.)

B.

1. Remplacer les mots en italiques par les pronoms qui conviennent:—
Tous les serpents ne sont pas vénimeux ; il y a *des serpents* qui sont tout à fait inoffensifs.
L'argent ne fait pas le bonheur, mais *l'argent* contribue *au bonheur*.
Si vous avez la santé, tâchez de conserver *la santé*.
Usez de la vie, n'abusez pas *de la vie*.
La Seine traverse Paris ; *la Seine* entre *dans Paris* à Charenton et sort *de Paris* Auteuil.

2. Indiquer d'une facon générale l'emploi du subjonctif. Donner six exemples raisonnés.

3. Donner sous forme de récit l'intrigue de la *Question d'Argent*
(A. DUMAS.)

4. Exposer la théorie du savant Meiser. (*L'Homme à l'oreille cassée.*
(ABOUT.)

5. (*a*) Faire le portrait de Dutrécy. (*Moi.* Labiche.)
(*b*) Quelle est votre opinion sur cette poésie, et quelle est la morale qui en découle ?

6. Questions orales.

GERMAN.

TUESDAY, SEPT. 19TH :—AFTERNOON, 2 TO 5.

1. Translate into English :—

Da entſtand am Eingang eine Bewegung. Ein gebieteriſcher Wink der Gattin rief den Kanzleirat nach der Thür, denn Graf Eſanady, der längſterwartete, hielt ſeinen Einzug.

Die Geſpräche ſtockten, und aller Augen hefteten ſich auf den

Ankömmling, der, nach rechts und links grüßend, vom kanzleirätlichen Ehepaar geleitet, dem Familientisch zuschritt. Er trug ein prachtvolles Bouquet in der Hand und überreichte es der Braut mit einigen Worten, die nicht minder duftig waren als der Blumenstrauß. Dann wechselte er mit den Übrigen ein paar Worte der Höflichkeit und pflanzte sich neben den Major, nachdem er sich demselben durch den Kanzleirat hatte vorstellen lassen. Die im Gespräch entstandene Pause benutzte der Graf, um sich des Wortes zu bewächtigen. Er that dies mit der ihm eigenen Sicherheit, von welcher die Damen behaupteten, daß sie ihm so gut stehe, indem er, unbekümmert um die abgebrochene Unterhaltung, sofort ein neues Thema aufnahm.

„Heut vor einem Jahr," hub er an, „habe ich mir nicht träumen lassen, daß ich diesen Tag in dem reizenden Hackelburg zubringen würde.

2. Translation into English at sight.

Translate :—

Nicht zu leugnen ist es, daß Allen das Herz klopfte, als die Tritte sich vorsichtig dem Hause näherten.

Der Hauptmann hatte das Fenster geöffnet und lauschte hinter dem Laden; die Übrigen traten ihm nach und vernahmen nun flüsternde Stimmen, aber ohne den Inhalt der Worte zu verstehen. Einige Minuten wurde alles still, dann verrieten die knisternden Zweige des Epheus, daß die Diebe heraufzuklettern begannen.

Atemlos standen die Lauscher und die Männer empfanden es als eine Qual, so unthätig zu warten, ja nicht einmal zu sehen, wie die Bösewichter sich näherten.

Plötzlich klirrte ein Fenster des Saals, und nun griffen der Hauptmann und seine Gefährten nach den Gewehren, denn jetzt galt es, auf der Hut zu sein, wollte man die Beute sich nicht entwischen lassen.

3. Translate into German :—

(*a*) May I ask if you have ever thought of the consequences of such an action? In the first place you would loose the respect

of your own brothers and sisters who love you, and have made sacrifices in order to give you the money necessary to complete your studies and prepare yourself for a good position in your native town. Secondly, you could not continue the work which you have so well begun, and your professor assures me that, if the latter part of your essay, or shall I say, dissertation, corresponds to the former, it will undoubtedly draw the attention of the Faculty. You now have an opportunity such as is seldom given to a young man. Do not throw it away by a mistake of this kind; you will regret it bitterly when it is too late.

(*b*) The man that hath no music in his soul, you know what Shakspeare says of him. I never have been able to understand those people who remain indifferent when they hear the music of Beethoven. Surely there is no finer pleasure than that, none that contains so much good and so little evil.

(*c*) There were once three students who crossed the Rhine and came to an inn where they were accustomed to put up. And as they went in, the hostess came to meet them and asked them what they would have. "Beer and wine," answered they, "and your pretty little daughter we should also like to see." "Fresh beer and clear wine ye can indeed have; but my daughter is no longer living; here she lies upon the bier."

4. (*a*) Write the 1st and 2nd Pers. Sing. Present Ind. and the Past Participle of:—
rief, hielt, zuschritt, trug, lassen, that, aufnahm, hub, würde, verrieten, griffen, traten.

(*b*) Have you any remark to make on the form *hub*?

(*c*) Why is *stehe* in the subjunctive in the first extract? Give a half dozen well-constructed sentences, exemplifying this construction.

5. Construct a few sentences containing examples of inseparable compound verbs which govern the dative case.

6. Give the original meanings of können and dürfen, and illustrate their various present meanings by brief sentences.

7. In what circumstances is the past participle used with the force of the present? Compose sentences in illustration.

8. State in detail what you know about the declension of the cardinal numbers up to *ten*.

9. Give sentences illustrating the use of the accusative absolute and of the cognate accusative.

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GREEK AUTHORS.

EUR. MEDEA ; DEM. PHIL. I. ; LUCIAN VERA HIST.

THURSDAY, SEPT. 21ST :—MORNING, 9 TO 11.

1. Translate :—

ἀλλ' ἕν τί μοι πρόσαντες· εἰ ληφθήσομαι
δόμους ὑπερβαίνουσα καὶ τεχνωμένη,
θανοῦσα θήσω τοῖς ἐμοῖς ἐχθροῖς γέλων.
κράτιστα τὴν εὐθεῖαν, ᾗ πεφύκαμεν
σοφοὶ μάλιστα, φαρμάκοις αὐτοὺς ἑλεῖν.
εἶεν·
καὶ δὴ τεθνᾶσι· τίς με δέξεται πόλις ;
τίς γῆν ἄσυλον καὶ δόμους ἐχεγγύους
ξένος παρασχὼν ῥύσεται τοὐμὸν δέμας ;
οὐκ ἔστι. μείνασ' οὖν ἔτι σμικρὸν χρόνον
ἢν μέν τις ἡμῖν πύργος ἀσφαλὴς φανῇ,
δόλῳ μέτειμι τόνδε καὶ σιγῇ φόνον·
ἢν δ' ἐξελαύνῃ συμφορά μ' ἀμήχανον,
αὐτὴ ξίφος λαβοῦσα, κεἰ μέλλω θανεῖν,
κτενῶ σφε, τόλμης δ' εἶμι πρὸς τὸ καρτερόν.

2. Translate ;—

ὦ φιλτάτη χείρ, φίλτατον δέ μοι στόμα
καὶ σχῆμα καὶ πρόσωπον εὐγενὲς τέκνων,
εὐδαιμονοῖτον ἀλλ' ἐκεῖ. τὰ δ' ἐνθάδε
πατὴρ ἀφείλετ'. ὦ γλυκεῖα προσβολή,
ὦ μαλθακος χρὼς πνεῦμά θ' ἥδιστον τέκνων.
χωρεῖτε χωρεῖτ'· οὐκέτ' εἰμὶ προσβλέπειν,
οἵα τ' ἔθ' ὑμᾶς, ἀλλὰ νικῶμαι κακοῖς.

καὶ μανθάνω μὲν οἷα δρᾶν μέλλω κακά,
θυμὸς δὲ κρείσσων τῶν ἐμῶν βουλευμάτων,
ὅσπερ μεγίστων αἴτιος κακῶν βροτοῖς

3. Comment on :—

(a) τίς δ' οὐχὶ θνητῶν ; ἆρτι γιγνώσκεις τόδε,
ὡς πᾶς τις αὐτὸν τοῦ πέλας μᾶλλον φιλεῖ,
οἱ μὲν δικαίως, οἱ δὲ καὶ κέρδους χάριν,
εἰ τούσδε γ' εὐνῆς εἵνεκ' οὐ στέργει πατήρ.

(b) βέβακε δ' ὅρκων χάρις, οὐδ' ἔτ' αἰδὼς
Ἑλλάδι τᾷ μεγάλᾳ μένει, αἰθερία δ' ἀνέπτα.

(c) δεῖ μ', ὡς ἔοικε, μὴ κακὸν φῦναι λέγειν,
ἀλλ' ὥστε ναὸς κεδνὸν ἰσοίακοστρόφον
ἄκροισι λαίφους κραιπέδοις ὑπεκδραμεῖν
τὴν σὴν στόμαργον, ὦ γύναι, γλωσσαλγίαν.

(d) ΜΗ. τί δρῶσα ; μὸν γαμοῦσα καὶ προδοῦσά σε ;

(e) ξένοις τε πέμπειν σύμβολ', οἳ δράσουσί σ' εὖ.

4. Translate :—δεῖ τοίνυν ταῦτ' ἐνθυμουμένους μὴ βοηθείαις πολεμεῖν (ὑστεριοῦμει γὰρ ἁπάντων), ἀλλὰ παρασκευῇ συνεχεῖ καὶ δυνάμει. ὑπάρχει δ' ὑμῖν χειμαδίῳ μὲν χρῆσθαι τῇ δυνάμει Λήμνῳ καὶ Θάσῳ καὶ Σκιάθῳ καὶ ταῖς ἐν τούτῳ τῷ τόπῳ νήσοις, ἐν αἷς καὶ λιμένες καὶ σῖτος καὶ ἃ χρὴ στρατεύματι πάνθ' ὑπάρχει· τὴν δ' ὥραν τοῦ ἔτους, ὅτε καὶ πρὸς τῇ γῇ γενέσθαι ῥᾴδιον καὶ τὸ τῶν πνευμάτων ἀσφαλές, πρὸς αὐτῇ τῇ χωρᾳ καὶ πρὸς τοῖς τῶν ἐμπορίων στόμασιν ῥᾳδίως ἔσται.

5. Translate :—καίτοι κα τοῦτο. εἴ τι πάθοι, καὶ τὸ τῆς τύχης ἡμῖν (ἥπερ ἀεὶ βελτιν ἢ ἡμεῖς ἡμῶν αὐτῶν ἐπιμελούμεθα) καὶ τοῦτ' ἐξεργάσαιτο, ἴσθ' ὅτι πλησίον μὲν ὄντες, ἅπασιν ἂν τοῖς πράγμασιν τεταραγμένοις ἐπιστάν-

τες, ὅπως βούλεσθε διοικήσαισθε, ὡς δὲ νῦν ἔχετ', οὐδὲ διδόντων τῶν καιρῶν, Ἀμφίπολιν δέξασθαι δύναισθ' ἄν, ἀπηρτημένοι καὶ ταῖς παρισκευαῖς καὶ ταῖς γνώμαις.

6. Comment on :—(*a*) οὐ γὰρ ἐχρῆν, ὦ ἀνδρες Ἀθηναῖοι, ταξιάρχους παρ' ὑμὸν, ἵππαρχον παρ' ὑμῶν, ἄρχοντες οἰκείους εἶναι, ἵν' ἦν ὡς ἀληθῶς τῆς πόλεως ἡ δύναμις ;

(*b*) ἀντιδόσεις — τὴν ἱρὰν τριήρη — ἀφεὶς τὴν εἰρωνείαν — τὰς ἀπὸ τοῦ βήματος ἐλπίδας.

(*c*) ἡμῶν δ' οἱ μὲν περιωτες μετὰ Λακεδαιμονίων φασὶ Φίλιππον πράττειν τὴν Θηβαίων κατάλυσιν καὶ τὰς πολιτείας διασπᾶν, οἱ δ' ὡς πρέσβεις πέπομφεν ὡς βασιλέα, οἱ δ' ἐν Ἰλλυριοῖς πόλεις τειχίζειν, οἱ δὲ — λόγους πλάττοντες ἕκαστος περιερχόμεθα.

7. Translate :—ἐπὶ δὲ τοῦ δεξιοῦ αὐτῶν ἐτάχθησαν οἱ Ἀεροκώνωπες ὄντες καὶ οἵτοι ἀμφὶ τὰς πέντε μυριάδας, πάντες τοξόται κώνωψι μεγάλοις ἐποχούμενα· μετὰ δὲ τούτους οἱ Ἀεροκάρδακες, ψιλοί τε ὄντες καὶ πεζοί, πλὴν μάχιμοί γε καὶ οὗτοι· πόρρωθεν γὰρ ἐσφενδόνων ῥαφανῖδας ὑπερμεγέθεις, καὶ ὁ βληθεὶς οὐδ' ἐπ' ὀλίγον ἀντέχειν ἠδύνατο, ἀπέθνησκε δέ, δυσωδίας, τινὸς τῷ τραύματι ἐγγινομένης· ἐλέγοντο δὲ χρίειν τὰ βέλη μαλάχης ἰῷ. ἐχόμενοι δὲ αὐτῶν ἐτάχθησαν οἱ Καυλομύκητες, ὁπλῖται ὄντες καὶ ἀγχέμαχοι τὸ πλῆθος μύριοι· ἐκλήθησαν δὲ Καυλομύκητες, ὅτι ἀσπίσιμὲν μυκητίναις ἐχρῶντο, δόρασι δὲ καυλίνοις τοῖς ἀπὸ τῶι ἀσπαράγων.

8. Comment on :—(*a*) ἦν δὲ ἡ μὲν πρώτη δίκη περὶ Αἴαντος τοῦ Τελαμῶνος, εἶτα χρὴ αὐτὸν συνεῖναι τοῖς ἥρωσιν εἴτε καὶ μή.

(*b*) οὐχ Ὅμηρος ἀλλὰ Γιγράνης.

(*c*) μυσαττόμενος τὴν κιαμοφαγίαν.

GREEK TRANSLATION AT SIGHT.

THURSDAY, SEPT. 21ST:—MORNING, 11 TO 12.

1. ἀμείβεται Δαρεῖος τοῖσιδε. "Ὀτάνη, ἦ πολλά ἐστι τὰ λόγῳ μὲν οὐκ οἷά τε δηλῶσαι, ἔργῳ δέ· ἄλλα δ' ἐστὶ τὰ λόγῳ μὲν οἷά τε, ἔργον δὲ οὐδὲν ἀπ' αὐτῶν λαμπρὸν γίνεται. ὑμεῖς δὲ ἴστε φυλακὰς τὰς κατεστεώσας ἐούσας οὐδὲν χαλεπὰς παρελθεῖν. τοῦτο μὲν γὰρ ἡμέων ἐόντων τοίων οὐδεὶς ὅστις οὐ παρήσει, τὰ μέν κου καταιδεόμενος ἡμέας, τὰ δέ κου καὶ δειμαίνων· τοῦτο δὲ ἔχω αὐτὸς σκῆψιν εὐπρεπεστάτην τῇ πάριμεν, φὰς ἄρτι τε ἥκειν ἐκ Περσέων καὶ βούλεσθαί τι ἔπος παρὰ τοῦ πατρὸς σημῆναι τῷ βασίλει. ἔνθα γάρ τι δεῖ ψεῦδος λέγεσθαι, λεγέσθω. τοῦ γὰρ αὐτοῦ γλιχόμεθα οἵ τε ψευδόμενοι καὶ οἱ τῇ ἀληθείῃ διαχρεώμενοι· οἱ μέν γε ψεύδονται τότε ἐπέαν τι μέλλωσι τοῖσι ψεύδεσι πείσαντες κερδήσεσθαι, οἱ δ' ἀληθιζονται ἵνα τῇ ἀληθείῃ ἐπισπάσωνται κέρδος καί τι μᾶλλον σφ' ἐπιτράπηται.

2. ΦΙΛΟΚΤΗΤΗΣ.

πρός νύν σε πατρὸς πρός τε μητρός, ὦ τέκνον,
πρός τ' εἴτί σοι κατ' οἶκον ἐστι προσφιλές,
ἱκέτης ἱκνοῦμαι, μὴ λίπῃς μ' οὕτω μόνον,
ἔρημον ἐν κακοῖσι τοῖσδ' οἵοις ὁρᾷς
ὅσοισί τ' ἐξήκουσας ἐνναίοντά με·
ἀλλ' ἐν παρέργῳ θοῦ με. δυσχέρεια μέν,
ἔξοιδα, πολλὴ τοῦδε τοῦ φορήματος·
ὅμως δὲ τλῆθι· τοῖσι γενναίοισί τοι
τό τ' αἰσχρὸν ἐχθρὸν καὶ τὸ χρηστὸν εὐκλεές.

GREEK PROSE.

THURSDAY, SEPT. 21ST:—AFTERNOON, 2 TO 3.

There are these three things to be done, Gentlemen:—First, you must send an army to the mines in the West, to arrest the foreigners returning at this time with gold in large quantities—thus your enemies will afford you the sinews of war. Next, by making use of the fleet of the mother city, you must harass the Eastern coast—thus you will inspire fear into the wealthy, and—for in that country wealth is king—gain anything you demand. Last, but not least, each one must apply himself willingly to drill, must prepare himself to undergo danger and endure toil, and, beyond all, so to love and honour his country as to endure to see such an one filling office as in times of peace might fill a more humble station.

GREEK GRAMMAR.

THURSDAY, SEPT. 21ST:—AFTERNOON, 3 TO 4.

1. Give Nom. and Gen. Sing. and Gender of the Greek for Triereme, fish, harbour, shame, hair, ear, worse.

2. 2nd Plur. Aor. Ind. Act. 3rd Sing. Pres. Opt. Act. 3rd Plur. Perf. Subj. Act. 2nd Sing. Pres. Imperat. Mid. Acc. Sing. Masc. Aor. Pars. Part. of:—

ἵημι, πείθω, ὁράω, ἐπινρέπω,

3. Give the value of *ἀνα, κατα, συν, μετα* in compound with *γιγώσκω, ἔρχομαι, φέρω.*

4. Give with examples the constructions used (1) with *αἰσχύνομαι,* (2) in Final Sentences, (3) with *φαίνομαι.*

5. Discuss the value of the Greek Dative.

GREEK HISTORY.

THURSDAY, SEPT. 21ST :—AFTERNOON, 4 TO 5.

1. Give an account of (*a*) the Confederacy of Delos. (*b*) The Sicilian Expedition.

2. Sketch the Athenian treatment of Megara in Perikles time.

3. Contrast the character of Themistokles and Alkibiades.

4. Write notes on i. The battle of Eurymedon.
ii. The Long Walls.
iii. Crœsus.

LATIN BOOKS.

SEPT. 14TH :—9 TO 11.

1. Translate :—

(*a*) Frigoribus parto agricolae plerumque fruuntur,
mutuaque inter se laeti convivia curant;
invitat genialis hiemps curasque resolvit:
ceu pressae cum iam portum tetigere carinae,
puppibus et laeti nautae imposuere coronas.
Sed tamen et quernas glandes tum stringere tempus
et lauri bacas oleamque cruentaque myrta;
tum gruibus pedicas et retia ponere cervis,
auritosque sequi lepores: tum figere dammas
stuppea torquentem Balearis verbera fondae,
cum nix alta iacet, glaciem cum flumina trudunt.

(*b*) Mox et frumentis labor additus, ut mala culmos esset robigo.

(*c*) Contemplator item, cum se nux plurima silvis induet in florem.

(*d*) Et studio incassum videas gestire "lavandi"

(*e*) Arboribusque satisque notus pecorique sinister.

2. Write a note on the metre of the line :—
Glauco et Panopeae et Inoo Melicertae.

3. Translate :—

(*a*) Dive quem proles Niobea magnae
vindicem linguae Tityosque raptor

Sensit et Troiae prope victor altae
Phthius Achilles,
ceteris maior, tibi miles impar,
filius quamvis Thetidis marinae
Dardanas turres quateret tremenda
cuspide pugnax.
ille mordaci velut icta ferro
pinus aut impulsa cupressus Euro
procidit late posiutque collum in
pulvere Teucro.

(*b*) Sectamur ultro, quos opimus
fallere et effugere est triumphus.

(*c*) multa Dircaeum levat aura cycnum.

(*d*) iudex honestum praetulit utili.

(*e*) dulce est desipere in loco.

(*f*) te belnosus qui remotis
obstrepit Oceanus Britannis.

(4) Translate :—Occupavit tamen Scipio Padum traicere, et ad Ticinum amnem motis castris, priusquam educeret in aciem, adhortandorum militum causa talem orationem est exorsus. "Si eum exercitum, milites educerem in aciem, quem in Gallia mecum habui, supersedissem loqui apud vos : quid enim adhortari referret aut eos equites, qui equitatum hostium ad Rhodanum flumen egregie vicissent, aut eas legiones, cum quibus fugientem hunc ipsum hostem secutus confessionem cedentis ac detractantis certamen pro victoria habui? nunc, quia ille exercitus Hispaniae provinciae scriptus, ibi cum fratre Cu. Scipione meis auspiciis rem gerit ubi eum gerere senatus populasque Romanus voluit, ego, ut consulem ducem adversus Hannibalem ac Poenos haberetis, ipse me huic voluntario certamini obtuli, novo imperatori apud novos milites pauca verba facienda sunt.

LATIN.

THURSDAY, SEPT. 14TH, 11 TO 12 A.M.

FOR UNSEEN TRANSLATION.

At ducis imperiis Minyae monituque frequentes
puppem umeris subeunt et tento poplite proni
decurrunt intrantque fretum. non clamor anhelis
nauticus aut blandus testudine defuit Orpheus.
tum laeti statuunt aras. tibi, rector aquarum,

summus honor, tibi caeruleis in litore vittis
et Zephyris Glaucoque bovem Thetidique iuvencam
deicit Ancaeus. non illo certior alter
pinguia letifera perfringere colla bipenni.
ipse ter aequoreo libans carchesia patri
sic ait Aesonides: 'o qui spumantia nutu
regna quatis terrasque salo complecteris omnes,
da veniam. scio me cunctis e gentibus unum
inlicitas temptare vias hiememque mereri:
sed non sponte feror nec nunc mihi iungere montes
mens avet aut summo deposcere fulmen Olympo.

LATIN COMPOSITION, GRAMMAR AND HISTORY.

THURSDAY, SEPT. 14TH, 2 TO 5 P.M.

1. For Latin prose :—

Chosroes advanced in person, intending to invest Theodosiopolis, but finding that it was too strong, he proceeded westward, and entering the Roman provinces marched in the direction of Caesarea in Cappadocia through the country, included between the Euphrates and the Lycus. The Romans marched to obstruct his advance in the Antitaurus mountains, in the north-east corner of Cappadocia, but when they approached Chosroes made a northward movement against Sebaste, which he took and burned. But he obtained no captives in that town, for, when the rumour spread that the Persians were coming, all the inhabitants of these districts fled. Finding himself in serious difficulties in a hostile and mountainous country and apparently not supported in the rear, Chosroes began to retreat.

2. (*a*) Principal parts and meaning of expergiscor, opperior, diligo, deligo, compleo.

(*b*) Explain what is meant by Sequence of Tenses, Oxymoron, Cognate Accusative, Indirect Command.

3. (*a*) What do you know of Marius, Sertorius, Camillus, Numa Pompilius, Agrippa, Saturninus.

(*b*) State briefly the events at Rome in 53-52 B.C., or 48-44 B.C.

(*c*) What do you know of the different assemblies of the Roman people?

GEOMETRY—ALGEBRA—TRIGONOMETRY.

FRIDAY, SEPTEMBER 15TH :—MORNING, 9 TO 12.

Write the answers in separate books marked A and B.

A.

1. Parallelograms which are equal in area and which have their sides reciprocally proportional, have their angles respectively equal.

2. Parallelograms about the diagonal of any parallelogram are similar to the whole parallelogram and to one another.

3. A number of two digits is equal to seven times the sum of the digits, show that if the digits be reversed, the number thus formed will be equal to four times the sum of the digits.

4. A piece of work can be done by A and B in 4 days, by A and C in 6 days, and by B and C in 12 days : find in what time it would be done by A, B, and C.

5. The sides of a triangle are 30 feet, 40 feet and 60 feet respectively, find the largest angle in it.

6. In a triangle $b = 647.324$, $c = 850.273$
$A = 103° 12' 54''$ find B.

B.

7. If four straight lines be proportional and a pair of similar rectilineal figures be similarly described on the first and second, and also a pair on the third and fourth, these figures shall be proportional.

8. The rectangle contained by the diagonals of a quadrilateral inscribed in a circle is equal to the sum of the two rectangles contained by the opposite sides.

9. Solve the equations :

(*a*) $x^2 - 14x = 120$

(*b*) $\sqrt{5(x+2)} = \sqrt{5} + 2$

(*c*) $2x + 3y = 8, \quad 7x - y = 5.$

(*d*) $\frac{8x+5}{14} \quad \frac{7x-3}{6x+2} = \frac{4x+6}{7}$

(*e*) $x^3 + y^3 = 126$
$x^2 - xy + y^2 = 21$

10. Simplify

$$\frac{2a}{(x-2a)^2} - \frac{x-a}{x^2-5ax+6a^2} + \frac{2}{x-3a},$$

and show that

$$\frac{7+3\sqrt{5}}{7-3\sqrt{5}} + \frac{7-3\sqrt{5}}{7+3\sqrt{5}} = 47.$$

11. Prove the following relations:

(*a*) $\dfrac{\operatorname{cosec}\theta}{\sec\theta} + \dfrac{\sec\theta}{\operatorname{cosec}\theta} = \sec\theta, \operatorname{cosec}\theta$

(*b*) $\tan(A+\beta) = \dfrac{\tan A + \tan\beta}{1 - \tan A + \tan\beta}$

(*c*) $\tan A + \tan\beta = \dfrac{\sin(A \pm \beta)}{\cos A \cos\beta}$

(*d*) $\dfrac{1-\cos A}{1+\cos A} = \tan^2\dfrac{A}{2}.$

12. A pole is fixed on the top of a mound, and the angle of elevation of the top and bottom of the pole are 60° and 30°, show that the pole is twice the height of the mound.

GEOMETRY.

FRIDAY, SEPTEMBER 15TH:—AFTERNOON, 2 TO 5.

Write the answers in separate books marked A and B.

A.

1. If two triangles be such that the sides of one are the polars of the vertices of the other, they are in perspective.

2. If two circles cut two other circles orthogonally, the radical axes of either pair is the line joining the other pair.

3. The circle of self-inversion of a given circle cuts it orthogonally.

4. Prove the property from which the nine-points circle of a triangle derives its name.

5 The sum of the squares of the four sides of a quadrilateral is equal to the sum of the squares of its diagonals plus four times the square of the line joining the middle points of the diagonals.

6. When the two sides of a triangle are given in magnitude, the area is a maximum when they contain a right angle.

B.

7. If A, B, C, D, etc., be any system of N points, O their centre of mean position, P any other point, the sum of the squares of the distances of the points A, B, C, D, etc., from P exceeds the sum of the square of the distances from O by $N\,OP^2$.

8. The rectangle contained by the perpendiculars from any point O in the circumference of a circle on two tangents AC and BC is equal to the square of the perpendicular from the same point on their chord of contact AB.

9. If four collinear points form a harmonic system, their four polars with respect to any circle form a harmonic pencil.

10. State and prove Pascal's Theorem.

11. If two circles, or a line and a circle, intersect each other, their angle of intersection is equal to the angle of intersection of their inverses.

12. Any line cutting a circle and passing through a fixed point is cut harmonically by the circle, the point and the polar of the point.

ALGEBRA—THEORY OF EQUATIONS.

WEDNESDAY, SEPT. 20TH:—MORNING, 9 TO 12.

1. Remove the fractional coefficients from the equation, keeping the coefficient of x^3 as unity.

$$x^3 - \frac{5}{2}x^2 - \frac{17}{18}x + \frac{1}{108} = 0.$$

2. State and prove Descartes' rule of signs in an equation.

3. The equation

$$x^4 - 6x + 8x^2 - 17x + 10 = 0$$

has a root 5; find the equation containing the remaining roots.

4. Transform the equation

$$x^4 - 4x^3 - 18x^2 - 3x + 2 = 0$$

into one which shall want the third term.

5. Find four numbers in Arithmetical Progression, such that the sum of their squares shall be 120, and that the product of the first and last shall be less than the product of the other two by 8.

6. Prove the truth of the Binomial Theorem for a positive fractional index.

7. Resolve into partial fractions

$$\frac{8 - x}{(2 - x)^2 (1 + x)}$$

8. Find three numbers in geometrical progression such that their sum is 14 and the sum of their squares 84.

9. How many words each containing 3 consonants and 2 vowels can be formed from 4 consonants and 4 vowels.

10. What is meant by *scales of notation?* Express 2157 in the scale of 6.

11. Prove the Binomial Theorem for a positive integral index.

12. If A be the arithmetic mean between B and C, and B the geometric mean between A and C, prove that C is the harmonic mean between A and B.

ENGLISH LITERATURE AND COMPOSITION.

MONDAY, SEPTEMBER 18TH:—9 A.M. TO 12.30 P.M.

(*Write the answers to A and B and C in separate books.*)

A. SPENSER: *Faerie Queene Bk. I.*

1. Explain the origin and construction of the Spenserian stanza. Mention some later poems in which it is adopted.

2. Narrate the incident of Una and the lion, and explain its significance.

3. Sketch Spenser's scheme for The Fairie Queene, and state how far it was carried out.

4. Explain, with etymological notes, the following words:—nathemore (make substantive), parbreake, lazars, leaches, leasing, yclad, yode, astonied.

B. TENNYSON: (*Selections.*)

1. What is the most generally recognised conclusion concerning the symbolical meaning of *The Lady of Shalott?*

2. Illustrate fully from the poems studied :—

a. Tennyson's knowledge of the classics.

b. Tennyson's sense of rhythm.

c. Tennyson's observation of nature.

3. Make short notes on :—lissome, the myriads of Assaye, the callow eaglet, the Ionian father of the rest, Eleusis, the silent field of Asphodel.

4. Tell, in outline, the story of *Dora*, *or* of Enoch Arden.

5. Write notes on :—Alliteration in Tennyson's verse, Tennyson's happy reviving of obsolete words.

C. English Composition.

Write an essay of not less than *three* pages on any *one* of the following subjects :—

Spenser's *Una*.

The Lesson of Tennyson's *Ulysses*.

The Life of the Mediæval Monk.

MODERN HISTORY.

Church, *The Beginning of the Middle Ages*.

Wednesday, September 26th :—2-4 p.m.

1. Sketch the career of Attila.

2. Describe the Anglo-Saxon conquest of Britain, and show how it differ, from the German migrations on the Continent.

3. Write what you know concerning the fortunes of the Eastern Empire between the death of Justinian and the coronation of Charlemagne at Rome.

4. Detail the quarrels which arose between Louis the Pious and his sons and the wars of the sons with each other after their father's death

5. Make short notes on : Genseric, Ulfila, Mayors of the Palace, Charlemagne's Capitularies, East Francia.

ENGLISH.

TRENCH: *Study of Words.*

WEDNESDAY, SEPT. 20TH:—4-5.15 P.M.

1. Show that *pagan Frank* and *mammetry* illustrate history in words.

2. Why and whence do new words arise? Illustrate.

3. (*a*) Give the derivation of *chancellor, parchment, gipsy*: (*b*) the Anglo-Saxon equivalent of *lunes, nave, plume*: (*c*) three question-begging epithets, with explanations.

4. Synonyms: illustrate by *authentic, abhor, contrary.*

5. Write three words that have declined in meaning and three that have risen. Give proofs.

6. Illustrate homonyms, giving the etymology in every case.

7. Take one word not given or used in the previous questions to illustrate each of five general statements not already touched on.

FRENCH.

SEPTEMBRE, 1899.

A.

1. Le Cousin Pons. (Balzac.)
   (*a*) Ecrire la biographie du héros.
   (*b*) Quelle était sa passion et comment la satisfaisait-il?
   (*c*) Quel est l'enseignement qui se dégage du livre?

2. Ruy Blas. (Hugo.)

   Faire un portrait de Don César de Bazan.

3. Le Cor. (de Vigny.)

   (*a*) Raconter d'après ce poème la conquête de l'Espagne par Charlemagne.
   (*b*) Faire ressortir quelques beautés du poème.

4. L'Idole. (Barbier.)
   Montrer comment cette allégorie suit la carrière de Napoléon.

B.

1. Ecrire une composition d'environ 200 mots sur un des sujets suivants:
   La Conférence de la Haye.

Le Journal de McGill.
L'Afrique du Sud.
La politique coloniale des Américains.

2. Traduire en français :—

(*a*) The song which I have heard sung. (*b*) The song which he has avoided singing. (*c*) I got my shoes made in Boston. (*d*) It is in vain that he speaks. (*e*) That is the greatest pleasure which this man enjoys. (*f*) You will find few people who can speak four languages. (*g*) You must depart now. (*h*) It is shameful that he is punished. (*i*) The town surrendered on the twenty-third of April.

(*b*) Expliquer l'emploi des participes passés dans les phrases qui précèdent.

3. Traduire en français :—

That beautiful old lady, with the white hair and the sad eyes, has had many sorrows. She has lost her husband and her children, and she is the last survivor of a great and powerful family. She leads a solitary patient life, and is the benefactress of the poor. Sometimes she travels, but her favourite residence is the old family house in England, where she visits the poor, and gives help and good counsels to the sick and the distressed. Her Christian kindness and her childlike humility are rare virtues. At Christmas she gives coal, blankets, and a good dinner to the poor old women of the neighbourhood. She was the younger daughter of her family, and she was married when she was eighteen. She is tall and slender, and is still straight and active. She loves children and flowers. The little children of the village bring wild flowers to their dear benefactress and friend.

4. Questions orales.

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ANALYTIC GEOMETRY (*First Paper*).

THURSDAY, SEPTEMBER 14TH:—MORNING, 9 TO 12.

1. Show that the problem "to trisect a given angle" may be reduced to "Given the base of a triangle and one base angle double the other, find the locus of the vertex." Solve this latter.

2. One of the two parallel sides of a trapesium is given in magnitude and position, and the other in magnitude; the sum of the two remaining sides is given: find the locus of the intersection of the diagonal.

3. In finding the co-ordinates of the points in a parabola the normals at which pass through a given point, show that we get a cubic equation, and interpret geometrically the fact that the sum of the roots of this equation is zero.

4. Find the conditions that two conic sections shall be similar and similarly placed.

5. Prove that if a circle intersect a conic, its chords of intersection will make equal angles with the axis.

(*a*) Hence obtain a construction for the circle of curvature.

6. In the parabola the subnormal is constant and equal to the semi-parameter.

7. The harmonic mean between the segments of a focal chord of an ellipse is constant.

8. The distance of the focus of an hyperbola from any point on the curve is equal to the length of a line drawn through the point parallel to the asymptote to meet the directrix.

9. Prove that the difference of the squares of any pair of conjugate diameters of an hyperbola is constant.

10. Find the equations of the tangents to the curves $xy = c^2$ and $y^2 = px$.

11. Find where the axes are cut by

$$x^2 + y^2 - 5x - 7y + 6 = 0.$$

12. Find the eccentricity and foci of the ellipse $2x^2 + 3y^2 - 1 = 0$.

13. Find the equation of the line drawn through the point of intersection of $y - 4x - 1 = 0$, and $2x + 5y - 6 = 0$ perpendicular to $3y + 4x = 0$.

14. Find the area of the triangle whose angular points are (2, 1) (4, 3) and (2, 5), proving any formula you employ.

ANALYTIC GEOMETRY (*Second Paper*).

FRIDAY, SEPTEMBER 15TH:—MORNING, 9 TO 12.

1. Find the general equation of all conics passing through the points where $\frac{x^2}{a^2} + \frac{y^2}{b^2} - 1 = 0$ meets the axes.

2. From the form of the equation show that the first three terms of

$$ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$$

represent two lines meeting the curve at infinity, and that the equation of the chord joining the two other points in which they meet the curve is

$$2gx + 2fy + c = 0.$$

3. Show that the focus of any conic may be considered as an infinitely small circle, touching the conic in two imaginary points situated on the directrix.

4. Given five points on a conic, derive from Pascal's Theorem a method of constructing the conic.

5. Find the co-ordinates of the centre of curvature at any point in a parabola.

6. Find the condition that the time $Ax + By + C = 0$ should touch the conic represented by the general equation.

7. Write down the general equation of the second degree in trilinear co-ordinates and find the condition that it may represent a circle.

8. Find the condition that two straight lines whose equations are given in trilinear co-ordinates may be mutually perpendicular.

9. Obtain by trilinear co-ordinates the harmonic properties of a complete quadrilateral.

10. Find the polar equation of the line passing through two points given in polar co-ordinates.

MATHEMATICS.

TUESDAY, SEPT. 19TH:—MORNING, 9 TO 1.

1. Prove that the volume of a truncated cone of height h is represented by

$$\frac{\pi h}{3}\ (R^2 + Rr + r^2)$$

where R and r are the radii of its two bases.

2. Define a prolate spheroid and find its surface.

3. Find the length of any arc of the catenary (measured from the vertex).

$$y = \frac{a}{2}\left(e^{\frac{x}{a}} + e^{\frac{-x}{a}}\right)$$

4. Prove that the area of any portion of the curve represented by

$$P\left(\frac{x}{a} + \frac{y}{b}\right) = c$$

is ab times the area of the corresponding portion of the curve

$$F\ (x, y) = c$$

5. Integrate

$$\int \frac{1 - x^2}{1 + x^2}\ \frac{dx}{\sqrt{1 + x^4}}\ ; \quad \int dx\ \sqrt{2 + \sqrt{2 + x^2}}$$

6. Integrate

$$\int x^4 \sin x\ dx\ ; \quad \int \tan^4 \theta\ d\theta\ ; \quad \int \cos^2 \theta \sin^4 \theta\ d\theta$$

7. Integrate

$$\int \frac{2x + 3}{x^3 + x^2 - 2x}\ ; \quad \int \frac{1 - x}{1 + x}\ dx\ ; \quad \int \frac{dx}{1 + x + x^2}.$$

8. Find the radius of curvature at any point of the catenary (see Question 5), proving your formula.

9. If two curves, whose equations are denoted by $u = 0$, and $u' = 0$ intersect at right angles, prove

$$\frac{du}{dx} \cdot \frac{du'}{dx} + \frac{du}{dy} \cdot \frac{du'}{dy} = 0.$$

10. Find the value of

$$\frac{x - \sin x}{x3} \quad \text{when } x = 0.$$

11. Prove that in any curve

$$ds = dr \sqrt{1 + \frac{r^2 \, d\theta^2}{dr^2}}$$

12. Expand sin x by MacLaurin's Thoerem.

13. Differentiate

$$y = x^x \; : \; y = x^{xn} \; : \; y = \sin^{-1}(x^n)$$

HIGHER ALGEBRA—THEORY OF EQUATIONS—TRIGONOMETRY.

WEDNESDAY, SEPT. 20TH:—MORNING, 9 TO 12.

1. State the rule for determining the signs to be affixed to each element of a determinant; and apply it to the element $a_3 \; b_5 \; c_2 \; d_1 \; e_4$ of the determinant $(a_1 \; b_2 \; c_3 \; d_4 \; e_5)$.

2. If every constituent in any column of a determinant is resolvable into the sum of two others, the determinant is resolvable into the sum of the two others.

3. Find the value of

$$\begin{vmatrix} 0 & -1 & -1 & 1 \\ 4 & 5 & 1 & 1 \\ 3 & 9 & 4 & 1 \\ -4 & 4 & 4 & 1 \end{vmatrix}$$

4. Solve by the method of determinants the equations

$$\begin{aligned} x + 2y + 3z &= 6 \\ 2x + 4y + z &= 7 \\ 3x + 2y + 9z &= 14. \end{aligned}$$

5. Show that

$$\begin{vmatrix} (b+c)^2 & a^2 & a^3 \\ b^2 & (c+a)^2 & b^2 \\ c^2 & c^2 & (a+b)^2 \end{vmatrix} = 2 \; abc \; (a+b+c)^2$$

6. Prove that on a sphere whose radius is r, the area of a spherical triangle is $2Er^2$ where $2E$ is the spherical excess.

7. In a spherical triangle prove

$$\cos \tfrac{1}{2} A = \sqrt{\frac{\sin s \sin (s-a)}{\sin b \sin c}}$$

8. In a spherical triangle, given $a = 100°$, $b = 37° 18'$, $c = 62° 46'$, from A.

9. In a right-angled spherical triangle given the hypotenuse $c = 81° 29' 32''$ and $A = 32° 28' 17''$, find B.

10. Give any method for finding an approximate value of π.

11. If the roots of the equation

$$x^3 + px^2 + qx + r = 0$$

are in Geometrical Progression, prove $rp^3 = q^3$. Hence solve the equation

$$x^3 - x^2 + 2x - 8 = 0.$$

12. Solve the following equation, the product of two of its roots being 2,

$$3x^3 - 2x^2 - 27x + 18 = 0.$$

LOGIC.

1. State any *one* of the three fundamental Laws of Thought on which Formal Logic is based: and show its practical applicability to any process of Logic.

2. Of the following terms state which are singular, general, positive, negative, connotative, non-connotative :—Organism, monopoly, antidote, the Renaissance, inadmissible, innocuous, His Excellency, unfamiliar.

3. Criticise the following definitions:

(*a*) A dog is a domestic animal.

(*b*) Tranquillity is the absence of unrest.

(*c*) Death is the end of life.

4. Distinguish fully, with the help of examples, between Contraries and Contradictories.

5. Explain and illustrate :—Mood, Undistributed Middle, Illicit Process, Fallacy of Four Terms.

6. Test the following examples of reasoning :—

(*a*) There is a purpose in everything reasonable, and therefore all amusements, being purposeless, are irrational.

(*b*) No two languages furnish equipollent words,—their phrases differ, their syntax and their idioms still more widely. But a translation, strictly so-called, requires an exact conformity in all these particulars, and also in numbers ; therefore it is impossible.

(*c*) That which was profitable, therefore prevailed, because it was honest withal ; which had it not been, it could never have been profitable.

7. Distinguish carefully between Deductive Logic and the Logic of Induction.

8. State and illustrate the application of the Method of Difference.

9. What is reasoning by Analogy ? Give an original example of its use.

10. Summarize Jevons' chapter on "The Requisites of a Philosophical Language."

GREEK BOOKS.

THURSDAY, SEPT. 21ST :—MORNING, 9 TO 12.

A.—PLATO, SELECTIONS.

Translate, with notes on words and phrases underlined :—

(1) πάντες γὰρ οἵ τε τῶν ἐπῶν ποιηταὶ οἱ ἀγαθοὶ οὐκ ἐκ τέχνης ἀλλ' ἔνθεοι ὄντες καὶ κατεχόμενοι πάντα ταῦτα τὰ καλὰ λέγουσι ποιήματα, καὶ οἱ μελοποιοὶ οἱ ἀγαθοὶ ὡσαύτως, ὥσπερ οἱ κορυβαντιῶντες | οὐκ ἔμφρονες ὄντες ὀρχοῦνται, οὕτω καὶ οἱ μελοποιοὶ οὐκ ἔμφρονες ὄντες τὰ καλὰ μελη ταῦτα ποιοῦσιν, ἀλλ' ἐπειδὰν ἐμβῶσιν εἰς τὴν ἁρμονίαν καὶ εἰς τὸν ῥυθμόν, καὶ βακχεύουσι καὶ κατεχόμενοι, ὥσπερ αἱ βάκχαι ἀρύτονται ἐκ τῶν ποταμῶν μελι καὶ γάλα κατεχόμεναι, ἔμφρονες δὲ οὖσαι οὔ, καὶ τῶν μελοποιῶν ἡ ψυχὴ τοῦτο ἐργάζιται ὥσπερ αὐτοὶ λέγουσι.

(2) πεπεισμένος δὲ ἐγὼ μηδένα ἀδικεῖν πολλοῦ δέω ἐμαυτόν γε ἀδικήσειν καὶ κατ' ἐμαυτοῦ ἐρεῖν αὐτός, ὡς ἄξιός εἰμί του κακοῦ καὶ τιμήσεσθαι τοιούτου τινὸς ἐμαυτῷ.

II. TRANSLATION AT SIGHT.

Stetit anxia classis
ad ducis eventum, metuens non arma nefasque,
sed ne submissis precibus Pompeius adoret
sceptra sua donata manu. Transire parantem
Romanus Pharia miles de puppe salutat
Septimius: qui, pro superum pudor! arma satelles
regia gestabat posito deformia pilo,
inmanis violentus atrox nullaque ferarum
mitior in caedes. Quis non, Fortuna, putasset
parcere te populis, quod bello haec dextra vacaret,
Thessaliaque procul tam noxia tela fugasses?
Disponis gladios, ne quo non fiat in orbe,
heu! facinus civile tibi; victoribus ipsis
dedecus et numquam Superum caritura pudore
fabula: Romanus regi sic paruit ensis,
Pellaeusque puer gladio tibi colla recidit,
Magne, tuo. Qua posteritas in saecula mittet
Septimium fama? scelus hoc quo nomine dicent,
qui Bruti dixere nefas? Iam venerat horae
terminus extremae, Phariamque ablatus in alnum
perdiderat iam iura sui, cum stringere ferrum
regia monstra parant; ut vidit comminus enses,
involvit voltus; atque indignatus apertum
Fortuae praestare caput, tunc lumina pressit
continuitque animam, ne quas effundere voces
vellet et aeternam fletu corrumpere famam.

THURSDAY, SEPTEMBER 14TH:—9 TO 12 P.M.

I. HORACE EPISTLES, BK. I.

1. Translate:

(*a*) Est animus tibi, sunt mores et lingua fidesque:
si quadringentis sex septem milia desunt,
plebs eris. At pueri ludentes; "rex eris," aiunt,
"si recte facies." Hic murus aheneus esto:
nil conscire sibi, nulla pallescere culpa.

Comment on *fides, quadringentis rex eris si recte facies.*

(*b*) Fingit equum tenera docilem cervice magister
ire viam, qua monstret eques; venaticus, ex quo
tempore cervinam pellem latravit in aula,

militat in silvis catulus. Nunc adbibe puro
pectore verba puer, nunc te melioribus offer.

Remark on the phrase *ire viam qua*, and the government of *viam*. Other readings are *quam* and *monstret*. Explain.

(*c*) Quid, si quis vultu torvo ferus et pede nudo
exiguaeque togae simulet textore Catonem,
virtutemne repraesentet moresque Catonis?
Rupit Iarbitam Timagenis aemula lingua,
dum studet urbanus tenditque disertus haberi.
Decipit exemplar vitiis imitabile: quodsi
pallerem casu, biberent exsangue cuminum.
O imitatores, servum pecus, ut mihi saepe
bilem, saepe iocum vestri movere tumultus!

Which Cato is referred to here? How is the construction of *textore* to be explained? Comment on *Iarbitam* and *Timagenis*.

II. VIRGIL, AENEID, Bk. VI.

2. Translate and comment on words in italics:

(*a*) Tu ne cede malis, sed contra audentior ito,
qua tua te Fortuna sinet, via prima salutis,
quod minime reris *Graia* pandetur ab *urbe*,

(*b*) Paulatim abnabam *terrae*: iam tuta *tenebam*,
ni gens crudelis madida cum veste gravatum
prensantemque uncis manibus capita *aspera montis*
ferro *invasisset*, praedamque ignara putasset.

3. Translate:

ne, pueri, ne tanta animis adsuescite bella,
neu patriae validas in viscera vertite vires:
tuque prior, tu parce, genus qui ducis Olympo;
proiice tela manu, sanguis meus!
ille triumphata Capitolia ad alta Corintho
victor aget currum, caesis insignis Achivis.
eruet ille Argos Agamemnoniasque Mycenas,
ipsumque Aeaciden, genus armipotentis Achilli,
ultus avos Troiae, templa et temerata Minervae.

Write an explanatory note on this passage.

III. SALLUST, CATILINE.

4. Translate and comment on words italicised:

Igitur *senati* decreto Q. Marcius Rex Faesulas, Q. Metellus Creticu- in Apuliam *circumque ea loca missi: hi utrique ad urbem imperatores* erant, impediti ne triumpharent *calumnia* paucorum, quibus omnia honesta atque inhonesta vendere mos erat. Sed praetores Q. Pompeius Rufus Capuam, *Q. Metellus Celer* in agrum Picenum; hisque permissum, "ut pro tempore atque periculo exercitum compararent." Ad hoc, "si quis indicavisset de conjuratione, quae contra rem publicam facta erat, praemium servo libertatem et *sestertia centum;* libero impunitatem eius rei, et sestertia ducenta;" itemque decrevere, "uti *gladiatoriae familiae* Capuam et in cetera municipia distribuerentur pro cuiusque opibus; Romae per totam urbem vigiliae haberentur, iisque *minores magistratus* praeessent."

IV. CICERO. { SELECT LETTERS. / PRO ROSCIO AMERINO.

5. Translate, with brief explanatory notes:

CICERO ATTICO SAL.

O hospitem mihi tam gravem *ἀμεταμέλητον*! fuit enim periucunde. Sed cum secundis Saturnalibus ad Philippum vesperi venisset, villa ita completa militibus est, ut vix triclinium, ubi cenaturus ipse Caesar esset, vacaret; quippe hominum CIO CIO. Sanc sum commotus, quid faturum esset postridie, ac mih. Barba Cassius subvenit: custodes dedit. Castra in agro; villa defensa est. Ille tertiis Saturnalibus apud Philippum ad h. vii. nec quemquam admisit: rationes opinor cum Balbo; inde ambulavit in litore. Post h. viii. in balneum; tum audivit de Mamurra; non mutavit. Unctus est, accubuit. *ἐμετικὴν* agebat; itaque et edit et bibit *ἀδεῶς* et iucunde, opipare sane et apparate, nec id solum, sed

bene cocto,
Condito, sermone bono et, si quaert, libenter.

Praeterea tribus tricliniis accepti *οἱ περὶ αὐτὸν* valde copiose; libertis minus lautis servisque nihil defuit: nam lautiores eleganter accepti. Quid multa? homines visi sumus. Hospes tamen non is, cui diceres: 'Amabo te, eodem ad me, cum revertere.' Semel satis est. *σπουδαῖον οὐδὲν* in sermone, *φιλόλογα* multa. Quid quaeris? delectatus est et libenter fuit. Puteolis se aiebat unum diem fore, alterum ad Baias. Habes hospitium sive *ἐπισταθμείαν* odiosam mihi, dixi, non molestam. Ego paulisper hic, deinde in Tusculanum. Dolabellae villam cum praeteriret, omnis armato- a dextra sinistra ad equum nec usquam alibi. Hoc ex Nicia.

(*b*) Ad eamne rem vos reservati estis ? ad eamne rem delecti, ut eos condemnaretis, quos sectores ac sicarii ingulare non potuissent? Solent hoc boni imperatores facere, cum proelium committunt, ut in eo loco, quo fugam hostium fore arbitrentur, milites collocent, in quos, si qui ex acie fugerint, de improviso incidant. Nimirum similiter arbitrantur isti bonorum emptores vos hic, tales viros, sedere, qui excipiatis eos, qui de suis manibus effugerint. Di prohibeant, iudices, ut hoc, quod maiores consilium publicum vocari voluerunt, praesidium sectorum existimetur. An vero, iudices, vos non intelligitis nihil aliud agi, nisi ut proscriptorum liberi quavis ratione tollantur, et eius rei initium in vestro iure iurando atque in Sex. Roscii periculo quaeri ? Dubium est ad quem maleficium pertineat, cum videatis ex altera parte sectorem inimicum, sicarium eumdemque accusatorem hoc tempore, ex altera parte egentem, probatum suis filium, in quo non modo culpa nulla, sed ne suspicio quidem potuit consistere ? Numquid hic aliud videtis obstare Roscio, nisi quod patris bona venierunt.

ANCIENT HISTORY.

FRIDAY, SEPTEMBER 15:—9 TO 12 A.M.

1. Describe the Arts and General Culture of the Chaldæans.

2. Name the four Grecian festivals that acquired a world-wide celebrity, and briefly describe them.

3. Give the dates of the following measures, and in each case state the advantage gained by the plebs, or the brief enactments of the measure : (*a*) The Decemviral legislation. (*b*) The Valerian laws. (*c*) The Licinian laws. (*d*) The Lex Hortensia.

4. To which of the Greek tribes did the Spartans belong ? Write a short account of their character and political institutions.

5. When and by whom were the following countries brought under the Dominion of Rome: Sicily, Gaul, Macedonia, Egypt, Africa, Illyricum ? Describe the provincial system of government.

6. Write brief notes on Phœnician commerce, colonies, and the arts disseminated by the Phœnicians.

7. Give the date and an account of the reign of Hadrian.

ENGLISH LITERATURE.

SHAKESPERE: *Tempest.* MILTON: *Paradise Lost, Bks. I and II.*

MONDAY, SEPTEMBER 18TH:—9-12 A. M.

1. Sketch the character of Caliban.

2. Indicate the internal evidence affecting the date of The Tempest.

3. Explain the following:—Argier, swabber, Poor John, cat o'mountain, gaberdine, murrain, marmoset, by'r lakin, inchmeal, pioned and twilled brims, stover, twink.

4. Give some account of the songs in The Tempest.

5. Analyse Milton's conception of Satan.

6. Show how far the council of the fallen angels follows parliamentary procedure.

7. Comment on the versification of Paradise Lost, with examples.

ENGLISH LITERATURE AND COMPOSITION

MONDAY, SEPTEMBER 18TH:—2-5 P.M.

CHARLES LAMB: *The Essays of Elia.*

I. Discuss, with illustrations, the auto-biographical character of *The Essays of Elia.*

2. Give some account of Charles Lamb's literary life and literary tastes as revealed in these Essays.

3. Note briefly, with illustrations, any three distinguishable peculiarities in Charles Lamb's diction.

4. Give, in outline, the substance of any *one* of the following Essays:

(*a*) My first play.

(*b*) The Two Races of Men.

(*c*) Dream-Children.

ENGLISH COMPOSITION.

Write an essay of not less than *three* pages on any *one* of the following subjects:—

Charles Lamb's Style.

Milton's Satan.

The Knightly Ideal.

MYERS, "*Mediæval and Modern History.*" *Part I.*

WEDNESDAY, SEPTEMBER 20TH :—2-5 P.M.

1. Describe the process of Mohammedan expansion during the 7th century.

2. Illustrate fully the nature of papal power at the time of its supremacy.

3. What are the principal incidents of German development under the Saxon emperors ?

4. Outline the history of any great Italian town during the Middle Ages.

5. Follow into as many fields of activity as possible the activity of the Northmen.

6. Make brief notes on : the Council of Whitby, the Church of S. Sophia, fief, John Gutenberg, Frossiart.

FRENCH.

SEPTEMBRE, 1899.

A.

1. Britannicus (Racine.)

Indiquer, de manière à faire ressortir l'intérêt dramatique, les relations et les passions des principaux personnages.

2. Le Misanthrope. (Molière.)

(*a*) Commenter les vers suivants :—

PHILINTE : Mais quand on est du monde, il faut bien que l'on rende
Quelques dehors civils que l'usage demande.

....

ALCESTE : Tous les hommes me sont à tel point odieux
que je serais fâché d'être sage à leurs yeux.

(*b*) Comparer Célimène et Eliante.

(*c*) Donner votre opinion sur le sonnet d'Oronte.

3. Les Nuits. (de Musset.)

Analyser la Nuit de Décembre.
Du temps que j'étais écolier, etc.

4. Cinq Mars. (de Vigny.)

(*a*) Résumer la carrière du héros.

(*b*) Définir la politique de Richelieu et dire votre opinion sur le grand cardinal (1) comme homme, (2) comme homme d'Etat.

B.

1. Traiter un des sujets suivants :

L'Influence de la Révolution sur la Littérature.
Napoléon, écrivain et orateur.
Le Théâtre Romantique.
La Morale de Molière.

2. Traduire en français les passages suivants :—

(*a*) The famous duel between these two knights took place during the siege of Dinan by the Duke of Lancaster in 1359. Du Guesclin was in Dinan with his young brother Oliver, and a truce for forty days having been signed, Oliver left the town and approached the English camp. On the way he met a renowned English knight, Sir Thomas of Canterbury who made him prisoner, and led him to his tent, in defiance (*au mépris*) of the truce. When Bertrand learned this treachery, he mounted his horse forthwith, and galloped to the English camp. He demanded an audience of the Duke of Lancaster, and was led to his tent, where the duke was playing chess (*aux échecs*) with Sir John Chandos, surrounded by the principal barons. "Be welcome, Bertrand," said the prince, having recognized him, and Bertrand knelt before the duke.

(*b*) When he had at last perceived them he asked them who they were, whence they came, and whither they were going. Ulysses replied to those questions. Then the giant rose slowly, and seizing one of the unfortunate Greeks, he dashed his head against the ground and thus ended his life. He devoured the unhappy man, and having drunk a huge pail of milk he lay down and slept. Next morning he set out for the pasturage with his flock, saying to Ulysses that he would devour one of his companions every evening, and that he would be the last to die. Then he let the great rock fall against the mouth of the cave and departed. He returned in the evening and slew another miserable Greek.

3. Questions orales.

FACULTY OF APPLIED SCIENCE.

EXHIBITION AND PRIZE EXAMINATIONS.

EXHIBITION AND PRIZE EXAMINATIONS.

SECOND YEAR.

MATHEMATICS.

SATURDAY, OCTOBER 7TH:—MORNING, 9 TO 12.

1. A quadrilateral inscribed in a circle has one side fixed and the opposite side of constant length. Find the locus of the intersection of the other two sides, and of the intersection of the diagonals.

2. Divide a given straight line into two parts such that the squares on the whole line and on one of the parts shall be together double of the square on the other part.

3. Show that the area of any zone of a sphere is proportional to its height.

4. In a parabola a diameter bisects all chords parallel to the tangent at its extremity.

5. Prove that the ratio of the distances of every point on an ellipse from a fixed point and a fixed straight line in its plane is constant. What is this ratio called? Show that it must be less than unity.

6. Solve (1) $b\,(a-x)-\frac{a}{b}\,(b+x)^2+ab\left(\frac{x}{b}+1\right)^2=0$

(2) $\left.\begin{aligned} x^4+x^2y^2+y^4&=2923\\ x^2-xy+y^2&=37\end{aligned}\right\}$

7. Simplify $\dfrac{2^n+1}{(2^n)^{n-1}}\div\dfrac{4^n}{(2^{n-1})^{n+1}}$.

8. Find the sum of n terms of the series y^2+2b, y^4+4b, y^6+6b .... .

9. By the Binomial Theorem find the cube root of 128 to 5 places of decimals.

10. Find the general value of θ which satisfies the equation

$$\frac{\sin\theta}{1+\cos\theta}=2-\cot\theta.$$

11. Show that (1) $\cot A = \operatorname{cosec} 2A + \cot 2A$.

(2) $\cos A + \cos 3A + \cos 5A + \cos 7A = 4 \cos A \cos 2A \cos 4A$.

12. Show how to solve a plane triangle when two sides and the included angle are given. Obtain a formula by which the third side may be found directly.

13. In any spherical triangle

(1) $\cos A = \sin B \sin C \cos a - \cos B \cos C$.

(2) $\cos \frac{a}{2} = \sqrt{\frac{\cos (S-B) \cos (S-C)}{\sin B \sin C}}$

14. Find the area of a spherical triangle.

15. The weights in an Atwood's machine are each 2 lbs. A bar weighing 4 ounces is placed on one of them.

Find (1) the velocity after 6 seconds, and

(2) the tension of the string.

THIRD AND FOURTH YEARS.

MATHEMATICS.

SATURDAY, OCTOBER 7TH:—MORNING, 9 TO 12.

*1. Find the equations of two lines passing through the point (4, 3), and each making with the axes in the first quadrant a triangle of area $24\frac{1}{2}$.

*2. Find the locus of the middle point of a line of constant length which moves so that its ends always touch two fixed perpendicular lines.

3. Find the equation of the tangent to the parabola $y^2 = 5x$ which is parallel to the line $3x = 2y$. Also find the point of contact.

4. Show that the abscissa of any point of an ellipse is divided by the normal at that point in the ratio $c^2 : b^2$.

†5. Find the equation of an ellipse referred to a pair of conjugate diameters as axes.

6. By differentiating $dx = \cos \phi \, ds$, and $dy = \sin \phi \, ds$, show that

$$(d^2 x)^2 + (d^2 y)^2 \quad (d\phi \, ds)^2 + (d^2 s)^2.$$

* Third Year only.
† Fourth " "

7. The radius of curvature of the curve $x^{\frac{2}{3}} + y^{\frac{2}{3}} = a^{\frac{2}{3}}$ at (x, y) is $3\sqrt[3]{axy}$.

8. The height of the greatest rectangle which can be inscribed in a given right segment of a parabola is $\frac{2}{3}$ of the height of the segment.

9. Show that

(1) $\int \sin^3\theta \, d\theta = -\cos\theta + \frac{1}{3}\cos^3\theta$,

(2) $\int \frac{dx}{x^2 - 2ax} = \frac{1}{2a} \log\left(\frac{x - 2a}{x}\right)$.

Also integrate (3) $\frac{2x\,dx}{(1 + x^2)(3 + x^2)}$.

10. Find the moment of inertia (1) of a circular annulus about a normal axis through the centre, (2) of the same about a diameter.

†11. Show that $\sin^{-1}x = x + \frac{1}{2} \cdot \frac{x^3}{3} + \frac{1 \cdot 3}{2 \cdot 4} \frac{x^5}{5} + \ldots$.

*12. A ball weighing 2 lbs. falls on a level floor with a velocity of 100 ft. per sec., and rebounds with a velocity of 76 ft. per sec. Find the average force between the ball and floor, the time of contact being $\frac{1}{10}$ sec.

*13. The time of vertical descent from a given point to the centre of a vertical circle is the same as that to the circumference down a tangent.

†14. Show that the tire of a bicycle becomes slack when making more than $\sqrt{\frac{g\,T}{\pi d\,W}}$ revolutions per second where W is the weight of the tire, T its tension and d its diameter.

THIRD YEAR.

DESCRIPTIVE GEOMETRY.

TUESDAY, OCTOBER 10TH.

1. One edge of a tetrahedron is inclined to the horizontal at 30° and an adjacent edge at 45°. Find (*a*) the horizontal projection and (*b*) the vertical projection on a plane making an angle of 30° with that edge which is inclined to the horizontal at 30°. The length of an edge is 2 ins.

* Third Year only.
† Fourth " "

2. Draw the plan of a cube of 2″ edge when two adjacent faces are inclined at angles of 50° and 70° respectively.

3. In the given Figure, AB is the axis of a cone represented in plan (ab) and elevation ($a'b'$). The horizontal trace of this cone is a circle $1\frac{3}{4}$″ dia. with centre a. The smaller circle 1″ dia. is the horizontal trace of a cylinder, a generator of which is given at cd, $c'd'$. Transfer this figure to your paper with the help of the pricker, and find the curve in which the two surfaces (that of the cone and that of the cylinder) intersect.

4. A right hexagonal prism, edge of end 1″, length $3\frac{1}{2}$ in., stands vertically on the H.P., so that its axis is $1\frac{1}{2}$ in. from the V.P. and a diagonal of the base is parallel to XY. It is surmounted centrally by a circular (cylindrical) cap $2\frac{1}{4}$ in. dia., $\frac{3}{4}$ in. thick. Mark by shading lines the shadow cast on the two planes of projection by these solids, and the shadow of the cap on the prism when the projections of the rays make angles 55° with XY.

5. The axis of a right circular cylinder of 2″ diameter is inclined at 45° to the horizontal and parallel to the vertical plane of projection. Determine the two planes touching the cylinder and inclined at 60° to the horizontal.

6. A plane mirror is inclined at 40° to the horizontal plane of projection; a ray of light passes through a point P before reflection and a point Q after reflection; pq, the horizontal projection of PQ, makes an angle of 60° with the horizontal trace of the plane of the mirror, and is cut by it in a point r, so that

$$\underline{pr}=2'', \underline{rq}=3''; \quad \underline{Pp}=2\tfrac{1}{2}'', \quad \underline{Qq}=4'';$$

find the distance of the point of reflection from P and Q, and the angle of reflection.

BRITISH ASSOCIATION EXHIBITION.
THEORY OF STRUCTURES.

THURSDAY, OCTOBER 12TH:—2 P.M.

1. Draw stress diagram for truss loaded as in Fig. 1.

Also determine by the method of moments the stress in the member XX.

2. If a wind pressure of 1·5 ton per lineal foot acts normally to AB, find, by the method of sections, the stresses in the members met by MN. Assume foot A of rafter fixed and foot C on rollers.

3. Three loads of 1, 2, and 3 tons at fixed distances of 6 ft. and 3 ft. apart, travel over a girder of 18 ft. span. Trace curves of max. $S.F.$ and $B.M.$

4. Explain what is meant by the ellipse of stress, and deduce its equation.

5. The cast iron channel shown by Fig. 3 is used as a conduit for the conveyance of water, and is supported at the two ends, the clear span being 20 ft. Find the max. stress in the metal when the conduit is full of water. What will be the limiting span for such a conduit, the safe stress per sq. in. being 1000 lbs.?

6. Deduce the relation :

$$q.w. = \frac{S}{I} A \bar{y},$$

q being the intensity of longitudinal shear, w the width of section, S the shearing force, I the moment of inertia, A the area between extreme fibre and section in question, and y the distance of $C.$ of $G.$ of area from neutral axis.

7. A girder consists of two equal flanges, each composed of a $9\frac{1}{2}$ in. $\times \frac{1}{2}$ in. plate connected with a 15 in. $\times \frac{1}{2}$ in. web, by means of two equal angle irons $3\frac{1}{2}$ in. $\times$ $3\frac{1}{2}$ in. $\times \frac{1}{2}$ in. Find the moment of resistance of the section, assuming the working stress is 12,000 lbs. per sq. inch.

How would you allow for rivets in top and bottom flanges?

8. The steel mast of a ship is of circular section and 50 feet in height. The metal is $\frac{1}{2}$ inch thick. Assuming that the mast is not stayed, find the max. stress in the metal if the effect of the wind is to produce a normal pressure of 100 lbs. per lineal ft. for a distance of 20 ft. from the top. Also find the stress in the metal 20 ft. from the top. The mast tapers from a diar. of 2 ft. at the bottom to 1 ft. at the top.

9. Explain how you would determine the strength of a long thin column.

10. Show how to determine the strength of shafting when subjected to torsion and bending, and also when subjected to torsion and a longitudinal force.

FACULTY OF ARTS

SESSIONAL EXAMINATIONS,

1900.

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GREEK.

FIRST YEAR SESSIONAL EXAMINATION.

GREEK BOOKS.

TUESDAY, APRIL 3:—MORNING, 9 TO 12.

(Answers to A, B and C are to be shown up in separate books. Students are recommended to divide their time equally between the three parts of the paper.)

A.—HOMER, ILIAD XXII.

1. Translate, with notes on words and phrases underlined;—

(*a*) ἀλλ' εἰ μὲν ζώουσι μετὰ στρατῷ, ἦ τ' ἂν ἔπειτα
χαλκοῦ τε χρυσοῦ τ' ἀπολυσόμεθ'· ἔστι γὰρ ἔνδον.
πολλὰ γὰρ ὤπασε παιδὶ γέρων ὀνομάκλυτος Ἀλτης.
εἰ δ' ἤδη τεθνᾶσι καὶ εἰν Ἀίδαο δόμοισιν,
ἄλγος ἐμῷ θυμῷ καὶ μητέρι, τοὶ τεκόμεσθα·

(*b*) τὴν δ' ἀπαμειβόμενος προσέφη νεφεληγερέτα Ζεύς
"θάρσει, τριτογένεια, φίλον τέκος· οὔ νύ τι θυμῷ
πρόφρονι μυθέομαι, ἐθέλω δέ τοι ἤπιος εἶναι.
ἔρξον ὅπῃ δή τοι ἰόος ἔπλετο, μηδέ τ' ἐρώει,"
ὣς εἰπὼν ὤτρυνε πάρος μεμαυῖαν Ἀθήνην·
βῆ δὲ κατ' Οὐλύμποιο καρήνων αἶξασα.

(*c*) ὣς ἄρα φωνήσας ειρύσσατο φάσγανον ὀξύ,
τό οἱ ὑπὸ λαπάρῃι τέτατο μέγα τε στιβαρόν τε,
οἴμησεν δὲ ἀλεὶς ὥς τ' αἰετὸς ὑψιπετήεις,

ὅς τ' εἶσιν πεδίονδε διὰ νεφέων ἐρεβεννῶν
ἁρπάξων ἢ ἄρν' ἀμαλὴν ἢ πτῶκα λαγών·
ὣς Ἕκτωρ οἴμησε τινάσσων φάσγανον ὀξύ.

(*d*) κεῖται πὰρ νήεσσι νέκυς ἄκλαυτος ἄθαπτος
Πάτροκλος· τοῦ δ' οὐκ ἐπιλήσομαι, ὄφρ' ἂν ἔγωγε
ζωοῖσιν μετέω καί μοι φίλα γούνατ' ὀρώρῃ.
εἰ δὲ θανόντων περ καταλήθοντ' εἰν Ἀΐδαο,
αὐτὰρ ἐγὼ καὶ κεῖθι φίλου μεμνήσομ' ἑταίρου.

(*e*) δευόμενος δέ τ' ἄνεισι πάις ἐς πατρὸς ἑταίρους,
ἄλλον μὲν χλαίνης ἐρύων, ἄλλον δὲ χιτῶνος·
τῶν δ' ἐλεησάντων κοτύλην τις τυτθὸν ἐπέσχεν,
χείλεα μέν τ' ἐδίην', ὑπερῴην δ' οὐκ ἐδίηνεν.

2. Give an account of the chief uses of the Genitive case in Homer.

3. What are the chief differences between Homeric and Attic Greek in regard to:—

(*a*) the use of κεν (= ἂν).
(*b*) the use of μετά.
(*c*) the Accusative with verbs of motion.
(*d*) the formation of the Subjunctive.

B.—LYSIAS, CONTRA ERATOSTHENEM.

1. Translate:—

(*a*) Τιμωρεῖσθαι μὲν δοκεῖν τῷ δ' ἔργῳ χρηματίζεσθαι.

(*b*) Οὐκ οὖν δεινόν, εἰ τοὺς μὲν στρατηγούς, οἳ ἐνίκων ναυμαχοῦντες, ὅτε διὰ χειμῶνα οὐχ οἷοί τ' ἔφασαν εἶναι τοὺς ἐκ τῆς θαλάττης ἀνελέσθαι, θανάτῳ ἐζημιώσατε, ἡγούμενοι χρῆναι τῇ τῶν τεθνεώτων ἀρετῇ παρ' ἐκείνων

δίκην λαβεῖν, τούτους δέ, οἳ ἰδιῶται μὲν ὄντες καθ' ὅσον ἐδύναντο ἐποίησαν ἡττηθῆναι ναυμαχοῦντες, ἐπειδὴ δ' εἰς τὴν ἀρχὴν κατέστησαν, ὁμολογοῦσιν ἑκόντες πολλοὺς τῶν πολιτῶν ἀκρίτους ἀποκτιννύναι, οὐκ ἄρα χρὴ αὐτοὺς καὶ τοὺς παῖδας ὑφ' ὑμῶν ταῖς ἐσχάταις ζημίαις κολάζεσθαι;

(*c*) Εἰ δὲ μὴ, ἐνταυθοῖ δῆλος ἔσται ὅτι ἐκεῖνά τ' αὐτῷ ἤρεσκε καὶ τοσοῦτον ἐδύνατο ὥστε ἐναντιούμενος μηδὲν κακὸν παθεῖν ὑπ' αὐτῶν.

(*d*) Παρεσκευάζοντο ἀπολέσαι τὴν πόλιν εἰ μὴ δι' ἄνδρας ἀγαθούς οἷς ὑμεῖς δηλώσατε παρὰ τῶν ἐχθρῶν δίκην λαβόντες ὅτι κἀκείνοις χάριν ἀποδώσετε.

(*e*) Μηδ' ὧν φασι μέλλειν πραξειν πλείω χάριν αὐτοῖς ἴστε, ἢ ὧν ἐποίησαν ὀργίζεσθε· μηδ' ἀποῦσι μὲν τοῖς τριάκοντα ἐπιβουλεύετε, παρόντας δ' ἀφῆτε· μηδὲ τῆς τύχης, ἥ τούτους παρέδωκε τῇ πόλει, κάκιον ὑμεῖς ὑμῖν αὐτοῖς βοηθήσητε.

(*f*) Ἡμεῖς δὲ νυνὶ εἰς κατηγορίαν καὶ ἀπολογίαν καθέσταμεν.

(*g*) Αὐτοῖς δὲ τοῖς τὴν πόλιν ἀπολέσασιν—ἦ που ἐπ' ἐκφορὰν πολλοὶ ἥξουσιν ὁπότε βοηθεῖν τοσοῦτοι παρασκευάζονται.

(*h*) Καὶ μὲν δὴ πολλῷ ῥᾷον ἡγοῦμαι εἶναι ὑπὲρ ὧν ὑμεῖς ἐπάσχετ' ἀντειπεῖν ἢ ὑπὲρ ὧν οὗτοι πεποιήκασιν ἀπολογήσασθαι.

2. What sea fight is alluded to in (*b*)?

C.—EURIPIDES, TROADES.

1. Translate:—

ἃ γὰρ γυναιξὶ σώφρον' ἔσθ' ηὑρημένα
ταῦτ' ἐξεμόχθουν Ἕκτορος κατὰ στέγας.

πρῶτον μέν, ἔνθα, κἂν προσῇ κἂν μὴ προσῇ
ψόγος γυναιξίν, αὐτὸ τοῦτ' ἐφέλκεται
κακῶς ἀκούειν, ἥτις οὐκ ἔνδον μένει,—
τούτου παρεῖσα πόθον ἔμιμνον ἐν δόμοις,
εἴσω τε μελάθρων κομψὰ θηλειῶν ἔπη
οὐκ εἰσεφρούμην·

Parse giving principal parts ηὑρημένα—ἐφέλκεται—μένει—παρεῖσα.

2. Translate with notes on words and phrases underlined:—

(a) μάτηρ δ' ὡσεὶ πτανοῖς κλαγγὰν
ὄρνις ἐξάρξω 'γὼ μολπὰν
οὐ τὰν αὐτὰν οἵαν δὴ
σκήπτρῳ Πριάμου διερειδομένα
ποδὸς ἀρχεχόρου πλαγαῖς Φρυγίαις
εὐκόμποις ἐξῆρχον θεούς.

(b) τάδε δεύτερά μοι μετὰ τὰν ἱερὰν
Θησέως ζαθέαν ἐλθεῖν χώραν.

(c) ἐγεινάμην τέκνα,
οὐκ ἀριθμὸν ἄλλως, ἀλλ' ὑπερτάτους Φρυγῶν,
οὓς Τρῳὰς οὐδ' Ἕλληνὶς οὐδὲ βάρβαρος
γυνὴ τεκοῦσα κομπάσειεν ἄν ποτε,
κἀκείνά τ' εἶδον δορὶ πεσόντ' Ἑλληνικῷ,
τρίχας τ' ἐτμήθην τάσδε πρὸς τύμβοις νεκρῶν.

(d) ὁρῶ τὰ τῶν θεῶν, ὡς τὰ μὲν πυργοῦσ' ἄνω
τὸ μηδὲν ὄντα τὰ δὲ δοκοῦντ' ἀπώλεσαν.

(e) τί γὰρ οὐκ ἔχόμεν;
τίνος ἐνδέομεν μὴ οὐ πανσυδίᾳ
χωρεῖν ὀλέθρου διὰ παντός;

FIRST YEAR SESSIONAL EXAMINATION.

GREEK COMPOSITION AND SIGHT TRANSLATION.

TUESDAY, APRIL 3RD:—AFTERNOON, 2 TO 4.30.

A.—Translate into Greek —

(1) The messengers themselves announced that the enemy were in want of food.

(2) He asked me whether those who were then present had shared in the danger.

(3) Do not attack those who are besieging the city.

(4) Philip commanded all the soldiers to obey the same generals, who had formerly led them into the enemies' country.

(5) Let us take care both in public and private to benefit the state to the best of our power.

(6) The citizens accused him of cowardice, though he had often fought bravely.

(7) He sent a thousand men to assist those who were about to sail against us.

(8) He said he would show us a place where many of the enemy were.

(9) If he had not greatly injured our allies, he would not have been punished.

(10) If he were to be appointed King, we should all be angry.

B.—Translate into English:—

Ἐπεὶ δὲ ἐκεῖσε ἀφίκετο, πρῶτον μὲν Τισσαφέρνης πέμψας ἤρετο αὐτὸν τίνος δεόμενος ἥκοι. ὁ δ' εἶπεν αὐτονόμους καὶ τὰς ἐν τῇ Ἀσίᾳ πόλεις εἶναι, ὥσπερ καὶ τὰς

ἐν τῇ παρ' ἡμῖν Ἑλλάδι. πρὸς ταῦτ' εἶπεν ὁ Τισσαφέρνης· Εἰ τοίνυν θέλεις σπείσασθαι ἕως ἂν ἐγὼ πρὸς βασιλέα πέμψω, οἶμαι ἄν σε ταῦτα διαπραξάμενον ἀποπλεῖν, εἰ βούλοιο. Ἀλλὰ βουλοίμην ἄν, ἔφη, εἰ μὴ οἰοίμην γε ὑπὸ σοῦ ἐξαπατᾶσθαι. Ἀλλ' ἔξεστιν, ἔφη, σοὶ τούτων πίστιν λαβεῖν ἢ μὴν ἀδόλως ἐμὲ ταῦτα πράξειν. Καὶ σοὶ δέ, ἔφη, ἔξεστι παρ' ἐμοῦ πίστιν λαβεῖν ἢ μὴν ἀδόλως σοῦ πράττοντος ταῦτα ἡμᾶς μηδὲν τῆς σῆς ἀρχῆς ἀδικήσειν ἐν ταῖς σπονδαῖς.

FIRST YEAR SESSIONAL EXAMINATION.

GREEK HISTORY.

TUESDAY, APRIL 3RD:—AFTERNOON, 4.30 TO 5.30.

1. (*a*) Who were the Alkmaionidai, and how did they influence Sparta?

(*b*) Give an account of the events leading up to the Burning of the Temple at Sardis and how this was used as a pretext?

2. Write notes on (*a*) Demaratos. (*b*) Sosikles. (*c*) Dionysios the Phokaian. (*d*) Artemisium.

3. Give (*a*) the life of Miltiades. (*b*) The effect of the battle of Plataea.

INTERMEDIATE EXAMINATION.

GREEK BOOKS.

TUESDAY, APRIL 3RD :—MORNING, 9 TO 12.

A, B and C to be shown up in separate books.

A. THUCYDIDES—*Rise of Athenian Empire. Capture of Sphakteria.*

1. Translate with notes on words and phrases underlined :

(*a*) ἐνταῦθα δὴ φανερῶς εἶπεν ὅτι ἡ μὲν πόλις σφῶν τετείχισται ἤδη ὥστε ἱκανὴ εἶναι σώζειν τοὺς ἐνοικοῦντας, εἴ δέ τι βούλονται Λακεδαιμόνιοι ἢ οἱ ξύμμαχοι, πρεσβεύεσθαι παρὰ σφᾶς ὡς πρὸς διαγιγνώσκοντας τὸ λοιπὸν τά τε σφίσιν αὐτοῖς ξύμφορα καὶ τὰ κοινά.

(*b*) εοήλου δ ἡ γραφὴ ὅτι "Θεμιστοκλῆς ἥκω παρὰ σέ, ὃς κακὰ μεν πλεῖστα Ἑλλήνων εἴργασμαι τὸν ὑμέτερον οἶκον, ὅσον χρόνον τὸν σὸν πατέρα ἐπιόντα ἐμοὶ ἀνάγκη ἠμυνόμην, πολὺ δ' ἔτι πλείω ἀγαθά, ἐπειδή ἐν τῷ ἀσφαλεῖ μὲν ἐμοι, ἐκείνῳ δὲ ἐν ἐπικινδύνῳ πάλιν ἡ ἀποκομιδή ἐγιγνετο. καί μοι εὐεργεσία ὀφείλεται (γράψας τὴν ἐκ Σαλαμῖνος προάγγελσιν τῆς ἀναχωρήσεως καὶ τὴν τῶν γεφυρῶν, ἣν ψευδῶς προσεποιήσατο, τότε δι' αὐτὸν οὐ διάλυσιν), καὶ νῦν ἔχων σε μεγάλα ἀγαθὰ δρᾶσαι πάρειμι διωκόμενος ὑπὸ τῶν Ἑλλήνων διὰ τὴν σὴν φιλίαν."

(*c*) νομίσαντες δὶ ἀπορεῖν ὅπῃ διέλθωσιν ἐπεστράτευσαν αὐτοῖς, καί τι καὶ τοῦ δήμου καταλύσεως ὑποψίᾳ

(*d*) ἐχώρει ἐς χωρία μὲν χαλεπά καὶ πετρώδη πρὸς τὸ πέλαγος τετραμμένα, σφῖσι δὲ τοῦ τείχους ταύτῃ ἀσθενεστάτου ὄντος ἐπισπάσασθαι αὐτοὺς ἠγεῖτο προθυμήσεσθαι.

(*e*) Κλέων δὲ ἐνταῦθα δή πολὺς ἐνέκειτο, λέγων γιγνώσκειν μὲν καὶ πρότερον οὐδὲν ἐν νῷ ἔχοντας δίκαιον αὐτούς, σαφὲς δ' εἶναι καὶ νῦν, οἵτινες τῷ μὲν πλήθει οὐδὲν ἐθέλουσιν εἰπεῖν, ὀλίγοις δὲ ἀνδράσι ξύνεδροι βούλονται γίγνεσθαι· ἀλλὰ εἴ τε ὑγιὲς διανοοῦνται, λέγειν ἐκελευσεν ἅπασιν.

(*f*) κατὰ νώτου τε ἀεὶ ἔμελλον αὐτοῖς, ἢ χωρήσειαν, οἱ πολέμοι ἔσεσθαι ψιλοὶ καὶ οἱ ἀπορώτατοι, τοξεύμασι καὶ ἀκοντίοις καὶ λίθοις καὶ σφενδόναις ἐκ πολλοῦ ἔχοντες ἀλκήν, οἷς μηδὲ ἐπελθεῖν οἷόν τε ἦν· φεύγοντές τε γὰρ ἐκράτουν καὶ ἀναχωροῦσιν ἐπέκειντο.

2. Write notes on Hellanikos — Zopyros.

B. SOPHOCLES, ELECTRA.

1. Translate with notes on words underlined :—

(*a*) ἐγὼ γὰρ ἡνίχ' ἱκόμην τὸ Πυθικὸν
μαντεῖον, ὡς μάθοιμ' ὅτῳ τρόπῳ πατρὶ
δίκας ἀροίμην τῶν φονευσαντων πάρα,
χρῄ μοι τοιαῦθ' ὁ Φοῖβος ὧν πεύσει τάχα·
ἄσκευον αὐτὸν ἀσ πίδων τε καὶ στρατοῦ
δόλοισι κλέψαι χειρὸς ἐνδίκους σφαγάς.

(*b*) ἀλλὰ ταῦτα μὲν μέθες· σὺ δὲ
τεμοῦσα κρατὸς βοστρύχων ἄκρας φόβας
κἀμοῦ ταλαίνης, σμικρὰ μὲν τάδ', ἀλλ' ὅμως
ἄχω, δὸς αὐτῷ, τήνδ' ἀλιπαρῆ τρίχα
καὶ ζῶμα τοὐμὸν οὐ χλιδαῖς ἠσκημένον.

(*c*) εὖτε γὰρ ὁ ποντισθεὶς Μυρτίλος ἐκοιμάθη,
παγχρυσέων δίφρων δυστάνοις αἰκίαις
πρόρριζος ἐκριφθείς, οὔ τί πω
ἔλειπεν ἐκ τοῦδ' οἴκου πολύπονος αἰκία.

(*d*) καὶ τοὺς μὲν ἄλλους πάντας ἀσφαλεῖς δρόμους
ὠρθοῦθ' ὁ τλήμων ὀρθὸς ἐξ ὀρθῶν δίφρων·
ἔπειτα λύων ἡνίαν ἀριστερὰν
κάμπτοντος ἵππου λανθάνει στήλην ἄκραν
παίσας· ἔθραυσε δ' ἄξονος μέσας χνόας.

(*e*) πρόδοτος δὲ μόνα σαλεύει
Ἠλέκτρα, τὸν ἀεὶ πατρὸς
δειλαία στενάχουσ', ὅπως
ἁ πάνδυρτος ἀηδών.

(*f*) ΧΟ. ὦ πόλις, ὦ γενεὰ τάλαινα, νῦν σοι
μοῖρα καθαμερία φθίνει φθίνει.
ΚΛ. ὤμοι πέπληγμαι. ΗΛ. παῖσον, εἰ σθένεις, διπλῆν.
ΚΛ. ὤμοι μάλ' αὖθις. ΗΛ. εἰ γὰρ Αἰγίσθῳ γ' ὁμοῦ.
ΧΟ. τελοῦσ' ἀραί· ζῶσιν οἱ γᾶς ὑπαὶ κείμενοι.
παλίρρυτον γὰρ αἷμ' ὑπεξαιροῦσι τῶν κτανόντων
οἱ πάλαι θανόντες.

(Mss. σε in line 1: Αἰγίσθω θ' in line 4.)

2. Translate and comment on :—

(*a*) τύπωμα χαλκόπλευρον ἠρμένοι χεροῖν.

(*b*) νῦν δ' ἐν κακοῖς μοι πλεῖν ὑφειμένῃ δοκεῖ,
καὶ μὴ δοκεῖν μὲν δρᾶν τι, πημαίνειν δὲ μή.

(*c*) οἶμαι μὲν οὖν οἶμαι τι κἀκείνῳ μέλον
πέμψαι ταδ' αὐτῇ δυσπρόσοπτ' ὀνείρατα.

(*d*) ἥκιστ'· ἐπείπερ οὐτ' ἐμοῦ καταξίως
πράξειας οὔτε τοῦ πορεύσαντος ξένου.
Some mss. κατ' ἀξίαν.

(*e*) οὐ γὰρ αἰσθάνει πάλαι
ζῶντας θανοῦσιν οὕνεκ' ἀνταυδᾷς ἴσα :
Mss ζῶν τοῖς.

C. Homer, Iliad VI.

Translate, with notes on words and phrases underlined:

(1) Γλαῦκος δ' Ἱππολοχοιο πάϊς καὶ Τυδέος υἱὸς
ἐς μέσον ἀμφοτέρων συνίτην μεμαῶτε μάχεσθαι.
Οἱ δ' ὅτε δὴ σχεδὸν ἦσαν ἐπ' ἀλλήλοισιν ἰόντες,
τὸν πρότερος προσέειπε βοὴν ἀγαθος Διομήδης·
Τίς δὲ σύ ἐσσι, φέριστε, καταθνητῶν ἀνθρωπων;
οὐ μὲν γάρ ποτ' ὄπωπα μάχῃ ἔνι κυδιανείρῃ
τὸ πρίν· ἀτὰρ μὲν νῦν γε πολὺ προβέβηκας ἁπάντων
σῷ θάρσει, ὅ τ' ἐμὸν δολιχόσκιον ἔγχος ἔμεινας.
Δυστήνων δέ τε παῖδες ἐμῷ μένει ἀντιόωσιν.

(2) ἀλλ' ἄρα μιν κατέκηε σὺν ἔντεσι δαιδαλέοισιν,
ἠδ' ἐπὶ σῆμ' ἔχεεν· περὶ δὲ πτελέας ἐφύτευσαν
Νύμφαι ὀρεστιάδες, κοῦραι Διὸς αἰγιόχοιο.
Οἳ δέ μοι ἑπτὰ κασίγνητοι ἔσαν ἐν μεγάροισιν,
οἳ μὲν πάντες ἰῷ κίον ἤματι Ἄϊδος εἴσω·
πάντας γὰρ κατέπεφνε ποδάρκης δῖος Ἀχιλλεύς,
βουσὶν ἐπ' εἰλιπόδεσσι καὶ ἀργεννῇς ὀΐεσσιν.

INTERMEDIATE EXAMINATION.

GREEK COMPOSITION AND TRANSLATION AT SIGHT.

Tuesday, April 3rd:—Afternoon, 2 to 4.30.

1. Translate into Greek:—

Accordingly the Athenians brought up their engines and were about to attack the city, hoping to capture it by storm. But the commander of the garrison sent a message

to ask whether it was permitted for the women, and others who took no part in the fighting, to go out first under a truce. The Athenians replied that they could not allow this: for if those in the city became fewer in number, they would have supplies for so much longer time. But he offered to allow them to come out, as they asked, on condition that each should bring out as much food as would support a man for a month. They agreed to these terms, came out, and went to their own homes.

2. Translate into English :—

(*a*) A proposal of Cyrus.

Ἐννοήσας δὲ ὅτι οἱ πρὸς αὐτὸν ἀφεστηκότες ὄντες πλησίον Βαβυλῶνος κακῶς πείσονται, ἢν μὴ αὐτὸς ἀεὶ παρῇ, οὕτως ὅσους τε τῶν πολεμίων ἀφίει, τούτους ἐκελευε λέγειν τῷ Ἀσσυρίῳ, καὶ αὐτὸς κήρυκα ἔπεμψε πρὸς αὐτὸν ταὐτὰ λέγοντα, ὅτι ἕτοιμος εἴη τοὺς ἐργαζομένους τὴν γῆν ἐᾶν καὶ μὴ ἀδικεῖν, εἰ κἀκεῖνος βούλοιτο ἐᾶν ἐργάζεσθαι τοὺς τῶν πρὸς ἑαυτὸν ἀφεστηκότων ἐργάτας. καίτοι, ἔφη, σὺ μὲν ἦν καὶ δύνῃ κωλύειν, ὀλίγους τινὰς κωλύσεις. ὀλίγη γάρ ἐστι χώρα ἡ τῶν πρὸς ἐμὲ ἀφεστηκότων· ἐγὼ δὲ πολλὴν ἄν σοι χώραν ἐῴην ἐνεργὸν εἶναι.

(*b*) And old Man's zeal.

ἄγ', ὦ γεραιὲ ποὺς, νεανίας γενοῦ
ἔργοισι, κεἰ μὴ τῷ χρόνῳ πάρεστί σοι.
ἐχθρὸν δ' ἐπ' ἄνδρα στεῖχε δεσποτῶν μέτα,
καὶ συμφόνευε καὶ συνεξαίρει δόμων.
τὴν δ' εὐσέβειαν εὐτυχοῦσι μὲν καλὸν
τιμᾶν, ὅταν δὲ πολεμίους δρᾶσαι κακῶς
θέλῃ τις, οὐδεὶς ἐμποδὼν κεῖται νόμος·

INTERMEDIATE EXAMINATION.

GREEK HISTORY AND LITERATURE.

TUESDAY, APRIL 3RD :—4.30 TO 5.30 P.M.

Answers A and B to be shown up in separate books.

A. HISTORY.

1. At what date was the Treasury of the funds of the Delian Confederacy removed to Athens? Indicate, by a narrative of the events of the period *immediately* preceding, to what extent this marked the culmination of Athenian power.

2. Indicate the chief constitutional changes during the ascendancy of Pericles. How far were they inevitable and how far the result of deliberate policy?

3. (*a*) With what do you associate the following names :—Thasos, Melos, Amphipolis, Phormio, Gylippus? Give dates.
(*b*) Explain fully the meanings of :—Prytaneia, cleruchy, trierarch.

B. GREEK LITERATURE.

1. Briefly compare and contrast the Homeric poems with those of Hesiod.

2. Write a short note on each of the following :—Stesichorus, Phocylides, Theognis, Tyrtaeus, Xenophanes, Arion, Phrynichus : also Lesbos Epinikion, Antistrophe, Megara, Parabasis.

3. State briefly the main points of contrast between the Ancient and the Modern Drama.

THIRD YEAR SESSIONAL EXAMINATION.

GREEK BOOKS.

MONDAY, APRIL 9TH :—MORNING, 9 TO 12.

Answers to A and B to be shown up in separate books.

A.—DEMOSTHENES, PRIVATE ORATIONS.

1. Translate :—

(*a*) Οὗτος γὰρ ἤδη καὶ γραφάς τινας πέφευγεν, ἐφ' αἷς οὐδὲν αἴτιος ὢν ἐγὼ συνδιαβάλλομαι, καὶ τῆς ἀρχῆς ἠμφεσβήτει ἣν ὑμεῖς ἐμὲ ἐχειροτονήσατε.

(β) Ἀλλ', ὦ χαλεπώτατε Βοιωτέ, μάλιστα μὲν ὧν πράττεις πάντων παῦσαι, εἰ δ' ἄρα μὴ βούλει, ἐκεῖνό γε πρὸς Διὸς πείθου· παῦσαι μὲν σαυτῷ παρέχων πράγματα, παῦσαι δ' ἐμὲ συκοφαντῶν, ἀγάπα δ' ὅτι σοί πόλις, οὐσία, πατὴρ γέγονεν. οὐδεὶς ἀπελαύνει σε ἀπὸ τούτων, οὔκουν ἔγωγε. ἀλλ' ἂν μέν, ὥσπερ εἶναι φῂς ἀδελφὸς, καὶ τὰ ἔργα ἀδελφοῦ ποιῇς, δόξεις εἶναι συγγενὴς, ἂν δ' ἐπιβουλεύῃς, δικάζῃ, φθονῇς, βλασφημῇς, δόξεις εἰς ἀλλότρια ἐμπεσὼν ὡς οὐ προσήκουσιν οὕτω χρῆσθαι.

(γ) Καὶ τοὺς μὲν ἄλλους τοὺς δανειζομένους ἴδοι τις ἂν ἐξισταμένους τῶν ὄντων· σοὶ δ' ὁ συμβεβληκὼς τοῦτο πέπονθε καὶ δανείσας τάλαντον δύο ὤφληκε συκοφαντηθείς.

(δ) Τουτὶ παντελῶς ἤδη καὶ ἀναιδές ἐστιν· οὐ γὰρ μόνον ἐκ τοῦ προκαλεῖσθαι τούτους παραδοῦναι, τοῦτον δὲ μὴ ἐθέλειν, ἀλλὰ καὶ ἐκ πάντων δηλόν ἐστι ψεῦδος ὄν. τίνος γὰρ ἕνεκ' ἔπειθον; ἵνα νὴ Δί' αὐτοὺς κτήσωμαι. ἀλλ' αἱρέσεώς μοι δοθείσης ἢ ἔχειν ἢ κομίσασθαι τὰ ἐμαυτοῦ εἰλόμην κομίσασθαι, καὶ ταῦτα μεμαρτύρηται.

(ε) Οὐ γὰρ ἂν δήπου τῶν αὐτῶν ἀδικημάτων παρόντων ἀμφοῖν ὁμοίως ἐγκαλῶν τὸν μὲν εἴασε τῷ δ' ἐδικάζετο.

(θ) Καὶ ταῦτ' ἔπραξεν, ὦ ἄνδρες δικασταὶ, οἰκῶν μὲν Ἀθήνησιν, οὔσης δ' αὐτῷ γυναικὸς ἐνθάδε καὶ παίδων, τῶν δὲ νόμων τὰ ἔσχατα ἐπιτίμια προτεθεικότων, εἴ τις οἰκῶν Ἀθήνησιν ἄλλοσέ ποι σιτηγήσειεν ἢ εἰς τὸ Ἀττικὸν ἐμπόριον ἔτι δ' ἐν τοιούτῳ καιρῷ ἐν ᾧ ὑμῶν οἱ μὲν ἐν τῷ ἄστει οἰκοῦντες διεμετροῦντο τὰ ἄλφιτα ἐν τῷ ᾠδείῳ, οἱ δ' ἐν τῷ Πειραιεῖ ἐν τῷ νεωρίῳ ἐλάμβανον κατ' ὀβολὸν τοὺς ἄρτους.

2. A brief note on the meaning of ἀφεῖναι καὶ ἀπαλλάξαι, βακτηρίαν φορεῖν, γλίσχρως, διαιτηταί, εἰσαγγελία, ἐξούλης δίκη, ἐχῖνος, ἰσοτελής, ῥῶπος, μὴ ὅτι.

B.—ARISTOPHANES, PLUTUS.

1. Translate with notes :—

(*a*) ἀλλ' εἴ τι χαίρεις ἀνδρὸς εὐόρκου τρόποις,
ἐμοὶ φράσον. ΠΛ. κλάειν ἔγωγέ σοὶ λέγω.
ΚΑ. δέχου τὸν ἄνδρα καὶ τὸν ὄρνιν τοῦ θεοῦ.

(*b*) ΧΟ. ὡς σεμνὸς οὑπίτριπτος· αἱ κνῆμαι δέ σου βοῶσιν
ἰοὺ ἰού, τὰς χοίνικας καὶ τὰς πέδας ποθοῦσαι.
ΚΑ. ἐν τῇ σορῷ νυνὶ λαχὸν τὸ γράμμα σου δικάζειν,
σὺ δ' οὐ βαδίζεις ; ὁ δὲ Χάρων τὸ ξύμβολον δίδωσιν.
ΧΟ. διαρραγείης ὡς μόθων εἶ καὶ φύσει κόβαλος.

(*c*) ΧΟ. ἡμεῖς δέ γ' αὖ ζητήσομεν θρεττανελὸ τὸν Κύκλωπα
βληχώμενοι, σὲ τουτονὶ πινῶντα καταλαβύντες,
πήραν ἔχοντα λάχανά τ' ἄγρια δροσερὰ, καιπαλῶντα.
ἡγούμενον τοῖς προβατίοις,
εἰκῇ δὲ καταδαρθόντα που,
μέγαν λαβόντες ἡμμένον σφηκίσκον ἐκτυφλῶσαι.

(*d*) πρὸς δέ γε τούτοις ἀνθ' ἱματίου μὲν ἔχειν ῥάκος·
ἀντὶ δὲ κλίνης
στιβάδα σχοίνων κόρεων μεστὴν, ἣ τοὺς εὕδοντας ἐγείρει·
καὶ φορμὸν ἔχειν ἀντὶ τάπητος σαπρόν· ἀντὶ δὲ προσκεφαλαίου,
λίθον εὐμεγέθη πρὸς τῇ κεφαλῇ· σιτεῖσθαι δ' ἀντὶ μὲν ἄρτων
μαλάχης πτόρθους, ἀντὶ δὲ μάζης φυλλεῖ' ἰσχνῶν ῥαφανίδων,
ἀντὶ δὲ θράνου στάμνου κεφαλὴν κατεαγότος,
ἀντὶ δὲ μάκτρας

φιδάκνης πλευρὰν ἐρρωγυῖαν καὶ ταύτην.

Scan this passage.

(*e*) ΚΛ. ἔπειτα πρὸς τὸ τέμενος ἦμεν τοῦ θεοῦ.
ἐπεὶ δὲ βωμῷ πόπανα καὶ προθύματα
καθωσιώθη, πέλανος Ἡφαίστου φλογὶ,
κατεκλίναμεν τὸν Πλοῦτον, ὥσπερ εἰκὸς ἦν·
ἡμῶν δ' ἕκαστος στιβάδα παρεκαττύετο.

(*f*) τὸ φρέαρ δ' ἐλαίου μεστόν· αἱ δὲ λήκυθοι
μύρου γέμουσι, τὸ δ' ὑπερῷον ἰσχάδων.
ὀξὶς δὲ πᾶσα καὶ λοπάδιον καὶ χύτρα
χαλκῆ γέγονε· τοὺς δὲ πινακίσκους τοὺς σαπροὺς
τοὺς ἰχθυηροὺς ἀργυροῦς πάρεσθ' ὁρᾶν.
ὁ δ' ἵππος γέγον' ἡμῖν ἐξαπίνης ἐλεφάντινος.
στατῆρσι δ' οἱ θεράποντες ἀρτιάζομεν.

(*g*) ΓΡ. καὶ νὴ Δί' εἰ λυπουμένην αἴσθοιτό με,
νηττάριον ἂν καὶ φάβιον ὑπεκορίζετο.
ΧΡ. ἔπειτ' ἴσως ἤτησ' ἂν εἰς ὑποδήματα.

2. Comment on the following passages, noting alternative readings for words underlined :—

(*a*) τί ἂν οὖν τὸ πραγμ' εἴη ; πόθεν καὶ τίνι τρόπῳ
Χρεμύλος πεπλούτηκ' ἐξαπίνης.

(*b*) ἄναξ Ἄπολλον καὶ θεοὶ, ποῖ τις φύγῃ ;

(*c*) ὦ τύμπανα καὶ κύφωνες, οὐκ ἀρήξετε ;

(*d*) ἔμπορος ἥκων ἐκ Θετταλίας παρὰ πλείστω
ἀνδραποδιστῶν.

(*e*) Θρασυβούλῳ Διονύσιον εἶναι ὅμοιον.

(*f*) ἵν' ὑπομνύμενον παύσω σε τῆς ἐκκλησίας.

(*g*) οὕτω πολυφόρῳ συγκέκραμαι δαίμονι.

(*h*) ναὶ, σκήπτομαι γ' ὅταν τύχω.
ἐὰν δὲ σύζυγον λάβω τινὰ καὶ σύκινον.

( ) μὴ μνησικακήσῃς, εἰ σὺ Φυλὴν κατέλαβες.

THIRD YEAR SESSIONAL EXAMINATION.

GREEK COMPOSITION AND TRANSLATION AT SIGHT.

MONDAY, APRIL 9TH:—AFTERNOON, 2 TO 4.30.

1. Translate into Greek:—

When the Athenians were sending an expedition to Egypt, Rochios, who worked for hire in a cobbler's workshop, wished to go, but said he was afraid to leave his wife, as she had no other means of support but his pay. So the cobbler offered to pay her during the absence of Rochios half of what he would have received. And at the end of the month she presented herself and received fifteen drachmai. Noticing her surprise at this, the cobbler asked her whether she considered it too little. But she replied that she would have been quite content with ten, for her husband had always told her that his wages were two obols a day. "He has cheated me for eight years," she exclaimed, "and if he does not perish at the hands of the enemy, from me at least he shall not escape scot-free."

2. Translate into English —

(*a*) Panic at Athens.

Ἐπειδὴ δὲ ταῦτα ἐγένετο, Πείσανδρος καὶ Χαρικλῆς, ὄντες μὲν τῶν ζητητῶν, δοκοῦντες δ' ἐν ἐκείνῳ τῷ χρόνῳ εὐνούστατοι εἶναι τῷ δήμῳ, ἔλεγον ὡς εἴη τὰ ἔργα τὰ γεγενημένα οὐκ ὀλίγων ἀνδρῶν ἀλλ' ἐπὶ τῇ τοῦ δήμου καταλύσει, καὶ χρῆναι ἐπιζητεῖν καὶ μὴ παύσασθαι. καὶ ἡ πόλις οὕτως διέκειτο, ὥστ' ἐπειδὴ τὴν βουλὴν εἰς το βουλευτήριον ὁ κῆρυξ ἀνείποι ἰέναι καὶ τὸ σημεῖον καθελοι, τῷ αὐτῷ σημείῳ ἡ μὲν βουλὴ εἰς τὸ βουλευτήριον ᾔει, οἱ δ' ἐκ

τῆς ἀγορᾶς ἔφευγον, δεδιότες εἰς ἕκαστος μὴ συλληφθείη. ἐπαρθεὶς οὖν τοῖς τῆς πόλεως κακοῖς εἰσαγγέλλει Διοκλείδης εἰς τὴν βουλήν, φάσκων εἰδέναι τοὺς περικόψαντας τοὺς Ἑρμᾶς, καὶ εἶναι αὐτοὺς εἰς τριακοσίους· ὡς δ' ἴδοι καὶ περιτύχοι τῷ πράγματι, ἔλεγε.

(*b*) Peleus reproaches Menelaos.

κἄπειτ' ἐκείνης οὕνεχ' Ἑλλήνων ὄχλον
τοσόνδ' ἀθροίσας ἦγαγες πρὸς Ἴλιον·
ἣν χρῆν σ' ἀποπτύσαντα μὴ κινεῖν δόρυ,
κακὴν ἐφευρόντ', ἀλλ' ἐᾶν αὐτοῦ μένειν,
μισθόν τε δόντα μήποτ' εἰς οἴκους λαβεῖν.
ἀλλ' οὔ τι ταύτῃ σὸν φρόνημ' ἐπούρισας·
ψυχὰς δὲ πολλὰς κἀγαθὰς ἀπώλεσας,
παίδων τ' ἄπαιδας γραῦς ἔθηκας ἐν δόμοις,
πολιούς τ' ἀφείλου πατέρας εὐγενῆ τέκνα.
ὧν εἷς ἐγὼ δύστηνος, αὐθέντην δὲ σὲ,
μιάστορ' ὥς τιν', ἐσδέδορκ' Ἀχιλλέως.
ὃς οὐδὲ τρωθεὶς ἦλθες ἐκ Τροίας μόνος,
κάλλιστα τεύχη δ' ἐν καλοῖσι σάγμασιν
ὅμοι' ἐκεῖσε δεῦρό τ' ἤγαγες πάλιν.

THIRD YEAR SESSIONAL EXAMINATION.

GREEK HISTORY AND LITERATURE.

MONDAY, APRIL 9th:—4.30 TO 5.30 P.M.

A and B to be shown up in separate books.

A.

1. What was the attitude of Sparta toward the Cyreians on their return to Europe?

2. State briefly the causes leading to the conspiracy of Kinadon.

3. Write brief notes on:—(*a*) The Battle of Koroneia.
(*b*) Konon.
(*c*) Phoibiades.
(*d*) The Sacred Band.

4. Discuss the significance of (I) The rebuilding of Messene.
(II) The Congress at Corinth after Chaeroneia.

B.

1. Give an outline sketch, with names and dates of the leading writers, of the development of Greek Tragedy down to the death of Euripides. What are the special features which distinguish the dramas of Euripides from those of his predecessors?

2. (*a*) Describe the arrangements for the production and judging of a play at the Great Dionysia in the time of Sophocles.

(*b*) Summarize the evidence for and against the existence of a stage in the Greek Theatre.

3. What are the main types of style in the Greek orators? Indicate the leading differences between Greek and English forensic oratory and the reasons for these. What do you know of the life and work of Andocides, Isaeus, Isocrates.

B.A. ORDINARY.

GREEK BOOKS.

THURSDAY, APRIL 12:—MORNING, 9 TO 12.

(*A and B are to be shown up in separate books.*)

A.—PLATO, REPUBLIC II, III, IV.

1. Translate:—

(*a*) Καὶ ὃ μὲν ἂν τούτῳ τῷ τρόπῳ βαφῇ, δευσοποιὸν γίγνεται τὸ βαφέν, καὶ ἡ πλύσις οὔτ' ἄνευ ῥυμμάτων οὔτε μετὰ ῥυμμάτων δύναται αὐτῶν τὸ ἄνθος ἀφαιρεῖσθαι· ἃ δ' ἂν μή, οἶσθα οἷα δὴ γίγνεται, ἐάν τέ τις ἄλλα χρώματα, βάπτῃ ἐάν τε καὶ ταῦτα μὴ προθεραπεύσας. Οἶδα, ἔφη· ὅτι ἔκπλυτα καὶ γελοῖα. Τοιοῦτον τοίνυν, ἦν δ' ἐγώ, ὑπό

λαβε κατὰ δύναμιν ἐργάζεσθαι καὶ ἡμᾶς, ὅτε ἐξελεγόμεθα τοὺς στρατιώτας καὶ ἐπαιδεύομεν μουσικῇ καὶ γυμναστικῇ· μηδὲν οἷον ἄλλο μηχανᾶσθαι, ἢ ὅπως ἡμῖν ὅ τι κάλλιστα τοὺς νόμους πεισθέντες δέξοιντο ὥσπερ βαφήν, ἵνα δευσοποιὸς αὐτῶν ἡ δόξα γίγνοιτο καὶ περὶ δεινῶν καὶ περὶ τῶν ἄλλων, διὰ τὸ τήν τε φύσιν καὶ τὴν τροφὴν ἐπιτηδείαν ἐσχηκέναι, καὶ μὴ αὐτῶν ἐκπλύναι τὴν βαφὴν τὰ ῥύμματα ταῦτα, δεινὰ ὄντα ἐκκλύζειν, ἥ τε ἡδονή, παντὸς χαλεστραίου δεινοτέρα οὖσα τοῦτο δρᾶν καὶ κονίας, λύπη τε καὶ φόβος καὶ ἐπιθυμία, παντὸς ἄλλου ῥύμματος.

Add a note on δέξοιντο.

2. Translate with a note where necessary : —

(*a*) Πότερον μελετητέον τοῦτο τῷ πλουσίῳ καὶ ἀβίωτον τῷ μὴ μελετῶντι, ἢ νοσοτροφία τεκτονικῇ μὲν καὶ ταῖς ἄλλαις τέχναις ἐμπόδιον τῇ προσέξει τοῦ νοῦ, τὸ δὲ Φωκυλίδου παρακελευμα οὐδὲν ἐμποδίζει.

(*b*) Πολλοῦ γὰρ ἄν, ἦ δ' ὅς, τὰ ὄργανα ἦν ἄξια.

(*c*) Διωκάθειν.

(*d*) Ἐπειδὰν τελεωθῶσιν.

(*e*) Ἐν ὑπονοίαις πεποιημένας.

(*f*) Ἄλλο τι ;

(*g*) Κινδυνεύει.

(*h*) Οὐκ ἐτὸς πάλαι ᾐσχύνου τὸ ψεῦδος λέγειν.

(*i*) Κατακλίσεις.

(*k*) Ὡς οὐχ ὅσιόν σοι ὂν μὴ οὐ βοηθεῖν. Note on μὴ οὐ.

3. Translate :—

Θρέψονται δὲ ἐκ μὲν τῶν κριθῶν ἄλφιτα σκευαζόμενοι, ἐκ δὲ τῶν πυρῶν ἄλευρα, τὰ μὲν πέψαντες, τὰ δὲ μάξαντες, μάζας γενναίας καὶ ἄρτους ἐπὶ κάλαμόν τινα παραβαλλ-

ὁμενοι ἢ φύλλα καθαρά, καταλινέντες ἐπὶ στιβάδων ἐστρωμένων μιλακί τε καὶ μυρρίναις, εὐωχήσονται αὐτοί τε καὶ τὰ παιδία.

4. What is the original subject of Plato's Republic and for what reason is the argument diverted to a description of the Ideal state?

B.—AESCHYLUS AGAMEMNON.

1. Translate and comment on :—

(*a*) *οὐδ' ὅστις πάροιθεν ἦν μέγας,*
παμμάχῳ θράσει βρύων,
οὐδὲ λέξεται πρὶν ὤν,
ὃς δ' ἔπειτ' ἔφυ, τρια-
κτῆρος οἴχεται τυχών.
Ζῆνα δέ τις προφρόνως ἐπινίκια κλάζων
τεύξεται φρενῶν τὸ πᾶν·
τὸν φρονεῖν βροτοὺς ὁδώ-
σαντα, τὸν πάθει μάθος
θέντα κυρίως ἔχειν.
στάζει δ' ἔν θ' ὕπνῳ πρὸ καρδίας
μνησιπήμων πόνος· καὶ παρ' ἄ-
κοντας ἦλθε σωφρονεῖν.
δαιμόνων δέ που χάρις βίαιος,
σελμα σεμνὸν ἡμένων.
Mss. *τῷ πάθει | βιαίως.*

(*b*) *φάος δὲ τηλέπομπον οὐκ ἠναίνετο*
φρουρά, πλέον καίουσα τῶν εἰρημένων·
λίμνην δ' ὑπὲρ Γοργῶπιν ἔσκηψεν φάος·
ὄρος τ' ἐπ' Αἰγίπλαγκτον ἐξικνούμενον
ὤτρυνε θεσμὸν μὴ χατίζεσθαι πυρός.
πέμπουσι δ' ἀνδαίοντες ἀφθόνῳ μένει

φλογὸς μέγαν πώγωνα, καὶ Σαρωνικοῦ
πορθμοῦ κάτοπτον πρῶν' ὑπερβάλλειν πρόσω
φλέγουσαν, ἔστ' ἔσκηψεν, εἶτ' ἀφίκετο
Ἀραχναῖον αἶπος, ἀστυγείτονας σκοπάς.
Mss. χαρίζεσθαι | κάτοπτρον | εἶτ. . . . εἶτ'.

(*c*) εὔφημον ἦμαρ οὐ πρέπει κακαγγελῷ
γλώσσῃ μιαίνειν· χωρὶς ἡ τιμὴ θεῶν.
ὅταν δ' ἀπευκτὰ πήματ' ἄγγελος πόλει
στυγνῷ προσώπῳ πτωσίμου στρατοῦ φέρῃ,
πόλει μὲν ἕλκος ἓν τὸ δήμιον τυχεῖν,
πολλοὺς δὲ πολλῶν ἐξαγισθέντας δόμων
ἄνδρας διπλῇ μάστιγι, τὴν Ἄρης φιλεῖ,
δίλογχον ἄτην, φοινίαν ξυνωρίδα·

(*d*) καὶ τὸ μὲν πρὸ χρημάτων
κτησίων ὄκνος βαλών,
σφενδόνας ἀπ' εὐμέτρου,—
οὐκ ἔδυ πρόπας δόμος
πημονᾶς γέμων ἄγαν,
οὐδ' ἐπόντισε σκάφος.

(*e*) ΧΟ. ἀμηχανῶ φροντίδος στερηθεὶς
εὐπάλαμον μέριμναν
ὅπα τράπωμαι, πίτνοντος οἴκου.
δέδοικα δ' ὄμβρου κτύπον δομοσφαλῆ
τὸν αἱματηρόν· ψακὰς δὲ λήγει.
δίκην δ' ἐπ' ἄλλο πρᾶγμα θηγάνει βλάβης
πρὸς ἄλλαις θηγάναισι Μοῖρα.

2. Write notes on :—

(*a*) νικᾷ δ' ὁ πρῶτος καὶ τελευταῖος δραμών.

(*b*) τείνοντα πάλαι τόξον, ὅπως ἂν]
μήτε πρὸ καιροῦ μήθ' ὑπὲρ ἄστρων
βέλος ἠλίθιον σκήψειεν·

(*c*) *ηὔξω θεοῖς δείσας ἂν ὧδ' ἔρδειν τάδε.*

3. Discuss the following Ms. readings :—

(*a*) *οὐκ ἄν γ' ἑλόντες αὖθις αὖ θάνοιεν ἂν*
v. l. *ἀνελόντες.*

(*b*) *ἄλις παρὰ Σκύμανδρον ἦλθ' ἀνάρσιος*
v. l. *ἦλθες.*

(*c*) *χαίρω· τεθνᾶναι δ' οὐκέτ' ἀντερῶ θεοῖς.*

(*d*) *ἔθρεψεν δὲ λέοντα σίνιν δόμοις ἀγάλακτον*
οὕτως ἀνὴρ φιλόμαστον.

(*e*) *οὐδὲ τὸν ὀρθοδαῆ τῶν φθιμένων ἀνάγειν*
Ζεὺς αὖτ' ἔπαυσεν ἐπ' ἀβλαβείᾳ (v. l. *εὐλαβείᾳ*).

(*f*) *οὐκ οἶδεν οἷα γλῶσσα μισητῆς κυνὸς*
λέξασα καὶ κτείνασα φαιδρόνους δίκην
ἄτης λαθραίου τεύξεται κακῇ τύχῃ.

B.A. ORDINARY.

GREEK COMPOSITION AND TRANSLATION AT SIGHT.

THURSDAY, APRIL 12TH :—AFTERNOON, 2 TO 4.30.

1. Translate into Greek :—

The action began by the Roman cavalry crossing the Siris, and driving back a squadron of the Thessalian horse, the remainder of which, with the elephants, were yet in rear. The main body of the Romans, inspirited by this success, followed across the bed of the river to assail the phalanxes. But they could make no impression on these solid masses ; the Principes took the place of the Hastati, and the Triarii succeeded to the Principes, in vain. Laevinus then ordered up his cavalry to attack the phalanxes

in flank. But they were met by the whole body of Thessalian horse, supported by the elephants. The Romans had never before seen these monstrous animals, which in their ignorance they called "Lucanian oxen:" their horses would not face them, and galloped back affrighted among the infantry. Pyrrhus now led his whole line forward, and the rout was general.

2. Translate into English :—

(*a*) ἀλλ', ὦ μακάριε, ὅρα μὴ ἄλλο τι τὸ γενναῖον καὶ τὸ ἀγαθὸν ᾖ τοῦ σώζειν τε καὶ σώζεσθαι. ἡδὺ γὰρ τοῦτο μὲν τὸ ζῆν· ὁπόσον δὲ χρόνον, τόν γε ὡς ἀληθῶς ἄνδρα ἐατέον ἐστὶ καὶ οὐ φιλοψυχητέον, ἀλλὰ ἐπιτρέψαντα περὶ τούτων τῷ θεῷ καὶ πιστεύσαντα ταῖς γυναιξίν, ὅτι τὴν εἱμαρμένην οὐδ' ἂν εἷς ἐκφύγοι, τὸ ἐπὶ τούτῳ σκεπτέον, τίν' ἂν τρόπον τοῦτον ὃν μέλλοι χρόνον βιῶναι ὡς ἄριστα βιώῃ, ἆρα ἐξομοιῶν αὑτὸν τῇ πολιτείᾳ ταύτῃ ἐν ᾗ ἂν οἰκῇ, καὶ νῦν δὲ ἆρα δεῖ σὲ ὡς ὁμοιότατον γίγνεσθαι τῷ δήμῳ τῷ Ἀθηναίων, εἰ μέλλεις τούτῳ προσφιλὴς εἶναι καὶ μέγα δύνασθαι ἐν τῇ πόλει· τοῦθ' ὅρα εἰ σοὶ λυσιτελεῖ καὶ ἐμοί.

(*b*) Ὡς δ' ὅτ' ἐν αἰγιαλῷ πολυηχέϊ κῦμα θαλάσσης
ὄρνυτ' ἐπασσύτερον, Ζεφύρου ὕπο κινήσαντος·
πόντῳ μέν τε πρῶτα κορύσσεται, αὐτὰρ ἔπειτα
χέρσῳ ῥηγνύμενον μεγάλα βρέμει, ἀμφὶ δέ τ' ἄκρας
κυρτὸν ἰὸν κορυφοῦται, ἀποπτύει δ' ἁλὸς ἀχνην·
ὣς τότ' ἐπασσύτεραι Δαναῶν κίνυντο φάλαγγες
νωλεμέως πόλεμόνδε. Κέλευε δὲ οἷσιν ἕκαστος
ἡγεμόνων· οἱ δ' ἄλλοι ἀκὴν ἴσαν (οὐδέ κε φαίης
τόσσον λαὸν ἕπεσθαι ἔχοντ' ἐν στήθεσιν αὐδήν),
σιγῇ δειδιότες σημάντορας· ἀμφὶ δὲ πᾶσιν
τεύχεα ποικίλ' ἔλαμπε, τὰ εἱμένοι ἐστιχόωντο.

B.A. ORDINARY.

GREEK HISTORY AND LITERATURE.

THURSDAY, APRIL 12TH :—AFTERNOON, 4.30 TO 5.30.

1. Show on a sketch-map of the Greek world (including Magna Graecia) (*a*) the great racial divisions, (*b*) the results of the battle of Coronea, (*c*) the arrangements of the Athenian allies for purposes of taxation.

2. Which do you consider the six most important battles in Greek history down to the death of Alexander (excluding Coronea)? Describe them briefly, giving names of commanders, and dates, and indicating their results.

3. What were the chief Athenian sources of revenue? Explain what is meant by the terms *λητουργία*, *ἐπίδοσις*, *ἀντιδοσις*. Give some account of the history of (*a*) the Tribute, (*b*) the Trierarchic system.

4. (*a*) Give an outline of the successive stages in an Athenian law-suit. Explain *ἐπωβελία*, *ἀπροστασίου γραφή*, *ἐξούλης δίκη*, *εὔθυνα*, *εἰσαγγελία*, *ἀγὼν ἀτίμητος*, *ἀνθυπωμοσία*, *διαιτήτης*.

(*b*) Date this paper in the Athenian style (year, month and day), assuming the Greek months to correspond exactly with the English.

5. Mention the chief points of difference between a tragedy of Shakspere and one of Aeschylus or Sophocles.

6. Trace the development of the idea of immortality in Greek Literature down to the time of Aristotle.

THIRD YEAR CLASSICAL HONOURS.

GREEK AND ROMAN HISTORY AND LITERATURE.

TUESDAY, 10TH APRIL:—MORNING, 9 TO 12.

A and B to be shown up in separate books.

A.

1. State the provisions of the chief Leges Agrariae at Rome, giving dates.

2. Trace the causes, progress and results of the Social War in Italy.

3. Write a short sketch of the reforms of Caesar.

4. What offices were monopolised by Augustus?

5. Characterise the successive stages in the development of Elegiac Poetry at Rome.

6. Virgil is essentially a religious poet. Adduce evidence of this.

7. Characterise the leading features of the style of Juvenal.

8. Distinguish the terms Asianism and Atticism, as applied to oratory.

B.

1. Give some account of the events which led to the battle of Marathon

2. Indicate the chief elements of weakness in the position of Athens at the opening of the Peloponnesian War. What was the policy of Athens during the first period of the war? What revolts of allies had occurred down to the sending of the Syracusan expedition? How far does the history of the Peloponnesian War foreshadow the ultimate success of Philip?

3. With what events are the following names associated? Give dates, Mantinea, Oenophyta, Onomarchus, Ithomé, Amyrtaeus, Euagoras. Abydos, Nemea, Sphodrias, Eubulus, Philocrates.

4. Give instances of celebrated Greek authors who were also generals, indicating the actions in which each fought and their result.

5. What is meant by the Homeric Question? Collect indications which have been thought to show, (i) that a considerable interval of time separated the poets of the Iliad from the time of which they wrote, (ii) that the Iliad, as we have it, cannot be the work of a single man, (iii) that the historical Agamemnon did not reign in Peloponnese.

6. Contrast the speeches in Thucydides from the standpint of Oratorical style, with the orations of Demosthenes or Isocrates.

7. What are the leading characteristics of the style of Plao? To what extent are they due to the nature of his subject-matter?

THIRD YEAR CLASSICAL HONOURS.

GREEK PRIVATE READINGS.

THURSDAY, APRIL 12TH :—MORNING, 9 TO 12.

A.—SOPHOCLES, ANTIGONE.

1. Translate :—

(*a*) ΦΥ. καὶ δὴ λέγω σοι. τὸν νεκρόν τις ἀρτίως
θάψας βέβηκε κἀπὶ χρωτὶ διψίαν
κόνιν παλύνας κἀφαγιστεύσας ἃ χρή.
ΚΡ. τί φής ; τίς ἀνδρῶν ἦν ὁ τολμήσας τάδε ;
ΦΥ. οὐκ οἶδ'· ἐκεῖ γὰρ οὔτε του γενῆδος ἦν
πλῆγμ', οὐ δικέλλης ἐκβολή· στύφλος δὲ γῆ
καὶ χέρσος, ἀρρὼξ οὐδ' ἐπημαξευμένη
τροχοῖσιν, ἀλλ' ἄσημος οὐργάτης τις ἦν.
ὅπως δ' ὁ πρῶτος ἡμὶν ἡμεροσκόπος
δείκνυσι, πᾶσι θαῦμα δυσχερὲς παρῆν.
ὁ μὲν γὰρ ἠφάνιστο. τυμβήρης μὲν οὔ,
λεπτὴ δ' ἄγος φεύγοντος ὡς ἐπῆν κόνις.

(*b*) ΧΟ. εὐδαίμονες οἷσι κακῶν ἄγευστος αἰών.
οἷς γὰρ ἂν σεισθῇ θεόθεν δόμος, ἄτας
οὐδὲν ἐλλείπει, γενεᾶς ἐπὶ πλῆθος ἕρπον·
ὅμοιον ὥστε ποντίαις οἶδμα δυσπνόοις ὅτιν
Θρῃσσαισιν ἔρεβος ὕφαλον ἐπιδράμῃ πνοαῖς,
κυλίνδει βυσσόθεν κελαινὰν θῖνα, καὶ
δυσάνεμοι στόνῳ βρέμουσιν ἀντιπλῆγες ἀκταί.

(*c*) ἀλλ' ἄνδρα, κεἴ τις ἦ σοφός, τὸ μανθάνειν
πόλλ' αἰσχρὸν οὐδὲν καὶ τὸ μὴ τείνειν ἄγαν.

ὁρᾷς παρὰ ῥείθροισι χειμάρροις ὅσα
δένδρων ὑπείκει, κλῶνας ὡς ἐκσῳζεται·
τὰ δ' ἀντιτείνοντ' αὐτόπρεμν' ἀπόλλυται.
αὕτως δὲ ναὸς ὅστις ἐγκρατῆ πόδα
τείνας ὑπείκει μηδέν, ὑπτίοις κάτω
στρέψας τὸ λοιπὸν σέλμασιν ναυτίλλεται.

(d) παρὰ δὲ Κυανεᾶν πελάγει διδύμας ἁλὸς
ἀκταὶ Βοσπόριαι ἠδ' ὁ Θρηκῶν – ∪ –
Σαλμυδησσός, ἵν' ἀγχίπολις Ἄρης
δισσοῖσι Φινεΐδαις
εἶδεν ἀρατὸν ἕλκος
τυφλωθὲν ἐξ ἀγρίας δάμαρτος.
ἀλαὸν ἀλαστόροισιν ὀμμάτων κύκλοις,
ἀραχθέντων ὑφ' αἱματηραῖς
χείρεσσι καὶ κερκίδων ἀκμαῖσιν.

(e) παιδός με σαίνει φθόγγος. ἀλλά, πρόσπολοι,
ἴτ' ἆσσον ὡκεῖς, καὶ παραστάντες τάφῳ
ἀθρήσαθ', ἁρμὸν χώματος λιθοσπαδῆ
δύντες πρὸς αὐτὸ στόμιον, εἰ τὸν Αἵμονος
φθόγγον συνίημ', ἢ θεοῖσι κλέπτομαι.

2. Comment on :—

(a) Ἐτεοκλέα μὲν, ὡς λέγουσι, συν δίκῃ
χρησθεὶς δικαίᾳ καὶ νόμῳ, κατὰ χθονὸς
ἔκρυψε (so Mss.)

(b) λόγοι δ' ἐν ἀλλήλοισιν ἐρρόθουν κακοί,
φύλαξ ἐλέγχων φύλακα.

(c) ΑΝ. ὅμως ὅ γ' Ἅιδης τοὺς νόμους τούτους ποθεῖ.
ΚΡ. ἀλλ' οὐχ ὁ χρηστὸς τῷ κακῷ λαχεῖν ἴσος

(d) τεάν, Ζεῦ, δύνασιν τίς ἀνδρῶν ὑπερβασία κατάσχοι;

(e) καὶ σ' οὔτ' ἀθανάτων φύξιμος οὐδεὶς...

(*f*) ἐπιστάμεσθα δ' ἐξ ὅτου λευκὴν ἐγὼ
τήνδ' ἐκ μελαίης ἀμφιβάλλομαι τρίχα,
μή πώ ποτ' αὐτὸν ψεῦδος ἐς πόλιν λακεῖν.

(*g*) καὶ ταῦτ' ἐπαινεῖς, καὶ δοκεῖς παρεικαθεῖν (so Mss.)

(*h*) τί δ' ἐστίν αὖ κάκιον ἢ κακῶν ἐτι ; (so Mss).

B.—THUCYDIDES VI.

1. Translate and explain :—

(*a*) νῦν μὲν γὰρ κἂν ἔλθοιεν ἴσως Λακεδαιμονίων ἕκαστοι ἀχριτί, ἐκείνως δ' οὐκ εἰκὸς ἀρχὴν ἐπὶ ἀρχὴν στρατεῦσαι· ᾧ γὰρ ἂν τρόπῳ τὴν ἡμετέραν μετὰ Πελοποννησίων ἀφέλωνται, εἰκὸς ὑπὸ τῶν αὐτῶν καὶ τὴν σφετέραν διὰ τοῦ αὐτοῦ καθαιρεθῆναι. ἡμᾶς δ' ἂν οἱ ἐκεῖ Ἕλληνες μάλιστα μὲν ἐκπεπληγμένοι εἶεν, εἰ μὴ ἀφικοίμεθα, ἔπειτα δὲ καὶ εἰ δείξαντες τὴν δύναμιν δι' ὀλίγου ἀπέλθοιμεν (τὰ γὰρ διὰ πλείστου πάντες ἴσμεν θαυμαζόμενα, καὶ τὰ πεῖραν ἥκιστα τῆς δόξης δόντα).

(*b*) καὶ νομίσατε νεότητα μὲν καὶ γῆρας ἄνευ ἀλλήλων μηδὲν δύνασθαι, ὁμοῦ δὲ τό τε φαῦλον καὶ τὸ μέσον καὶ τὸ πάνυ ἀκριβὲς ἂν ξυγκραθὲν μάλιστ' ἂν ἰσχύειν, καὶ τὴν πόλιν, ἂν μὲν ἡσυχάζῃ, τρίψεσθαί τε αὐτὴν περὶ αὑτὴν ὥσπερ καὶ ἄλλο τι, καὶ πάντων τὴν ἐπιστήμην ἐγγηράσεσθαι, ἀγωνιζομένην δὲ αἰεὶ προσλήψεσθαί τε τὴν ἐμπειρίαν καὶ τὸ ἀμύνεσθαι οὐ λόγῳ ἀλλ' ἔργῳ μᾶλλον ξύνηθες ἕξειν.

(*c*) ξυνέβη δὲ πρός τε σφᾶς αὐτοὺς ἅμα ἔριν γενέσθαι, ᾧ τις ἕκαστος προσετάχθη, καὶ ἐς τοὺς ἄλλους Ἕλληνας ἐπίδειξιν μᾶλλον εἰκασθῆναι τῆς δυνάμεως καὶ ἐξουσίας ἢ ἐπὶ πολεμίους παρασκευήν.

(*d*) τούς τε στρατηγοὺς καὶ ὀλίγους καὶ αὐτοκράτορας χρῆναι ἑλέσθαι καὶ ὀμόσαι αὐτοῖς τὸ ὅρκιον ἢ μὴν ἐάσειν

ἄρχειν ὅπῃ ἂν ἐπίστωνται· οὕτω γὰρ ἄ τε κρύπτεσθαι δεῖ μᾶλλον ἂν στέγεσθαι καὶ τἆλλα κατὰ κόσμον καὶ ἀπροφασίστως παρασκευασθῆναι.

(*e*) Ἀναγκαῖον περὶ τῆς ἐμῆς διαβολῆς πρῶτον ἐς ὑμᾶς εἰπεῖν, ἵνα μὴ χεῖρον τὰ κοινὰ τῷ ὑπόπτῳ μου ἀκροάσησθε, τῶν δ' ἐμῶν προγόνων τὴν προξενίαν ὑμῶν κατά τι ἔγκλημα ἀπειπόντων αὐτὸς ἐγὼ πάλιν ἀναλαμβάνων ἐθεράπευον ὑμᾶς ἄλλα τε καὶ περὶ τὴν ἐκ Πύλου ξυμφοράν.

2. Comment on :—

(*a*) ἔτει πέμπτῳ μετὰ Συρακούσας οἰκισθείσας Λεοντίνους. . .οἰκίζουσι.

(*b*) ἄλλως τε κεἰ ξυστῶσιν αἱ πολεῖς φοβηθεῖσαι (so Mss.).

(*c*) ὅσα μέντοι ἤδη δοκεῖν αὐτῷ, τριήρεσιν οὐκ ἔλασσον ἢ ἑκατὸν πλευστέα εἶναι.

(*d*) αἰσθανόμενος αὐτοὺς μέγα παρὰ βασιλεῖ Δαρείῳ δύνασθαι.

(*e*) ἀπελθόντες ἐς Νάξον καὶ Θρᾶκας καὶ σταυρώματα περὶ τὰ στρατόπεδον ποιησάμενοι αὐτοῦ διεχείμαζον (so Mss.)

(*f*) καὶ τὸ μὲν δεκάπλεθρον προτείχισμα αὐτῶν αἱροῦσι καὶ διεπόρθησαν, αὐτὸν δὲ τὸν κύκλον Νικίας διεκώλυσεν.

3. How did the Athenians first establish themselves at Syracuse?

C.—PLATO, SELECTIONS.

1. Translate and explain, with reference to the context in each case :—

(*a*) Τί δαί; ἦν δ' ἐγώ· οὐδενὶ ἔξεστιν αὐτοὺς τύπτειν·

Καὶ μάλα, ἔφη, τῷ ὀρεοκόμῳ. Δούλῳ ὄντι ἢ ἐλευθέρῳ; Δούλῳ, ἔφη. Καὶ δοῦλον, ὡς ἔοικεν, ἡγοῦνται περὶ πλείονος ἢ σὲ τὸν υἱόν, καὶ ἐπιτρέπουσι τὰ ἑαυτῶν μᾶλλον ἢ σοί, καὶ ἐῶσι ποιεῖν ὅ τι βούλεται, σὲ δὲ διακωλύουσι.

(*b*) τέως μὲν οὖν παρέθει ἐν τῇ νηΐ ἀντεχόμενος τοῦ δόρατος· ἐπεὶ δὲ δὴ παρημείβετο ἡ ναῦς τὴν ναῦν καὶ ἐπέσπα αὐτὸν τοῦ δόρατος ἐχόμενον, ἠφίει τὸ δόρυ διὰ τῆς χειρός, ἕως ἄκρου τοῦ στύρακος ἀντελάβετο.

(*c*) Ἀναξαγόρου οἴει κατηγορεῖν, ὦ φίλε Μέλητε, καὶ οὕτω καταφρονεῖς τῶνδε καὶ οἴει αὐτοὺς ἀπείρους γραμμάτων εἶναι, ὥστε οὐκ εἰδέναι ὅτι τὰ Ἀναξαγόρου βιβλία τοῦ Κλαζομενίου γέμει τούτων τῶν λόγων; καὶ δὴ καὶ οἱ νέοι ταῦτα παρ' ἐμοῦ μανθάνουσιν, ἃ ἔξεστιν ἐνίοτε, εἰ πάνυ πολλοῦ, δραχμῆς ἐκ τῆς ὀρχήστρας πριαμένοις Σωκράτους καταγελᾶν, ἐὰν προσποιῆται ἑαυτοῦ εἶναι, ἄλλως τε καὶ οὕτως ἄτοπα ὄντα.

(*d*) καὶ οὕτω μὲν καθαροὶ ἀπαλλαττόμενοι τῆς τοῦ σώματος ἀφροσύνης, ὡς τὸ εἰκός, μετὰ τοιούτων τε ἐσόμεθα καὶ γνωσόμεθα δι' ἡμῶν αὐτῶν πᾶν τὸ εἰλικρινές· τοῦτο δ' ἐστὶν ἴσως τὸ ἀληθές. μὴ καθαρῷ γὰρ καθαροῦ ἐφάπτεσθαι μὴ οὐ θεμιτὸν ᾖ.

(*e*) εἰ γὰρ ἐθέλει τις τῶν Σωκράτους ἀκούειν λόγων, φανεῖεν ἂν πάνυ γελοῖοι τὸ πρῶτον· τοιαῦτα καὶ ὀνόματα καὶ ῥήματα ἔξωθεν περιαμπέχονται, Σατύρου δή τινα ὑβριστοῦ δοράν. ὄνους γὰρ κανθηλίους λέγει καὶ χαλκέας τινὰς καὶ σκυτοτόμους καὶ βυρσοδέψας, καὶ ἀεὶ διὰ τῶν αὐτῶν ταὐτὰ φαίνεται λέγειν, ὥστε ἄπειρος καὶ ἀνόητος ἄνθρωπος πᾶς ἂν τῶν λόγων καταγελάσειε.

(*f*) ὅταν δὲ δὴ πρὸς δαῖτα καὶ ἐπὶ θοίνην ἴωσιν κραν ὑπὸ τὴν ὑπουράνιον ἀψῖδα πορεύονται πρὸς ἄνακτες ἤδη.

τὰ μὲν θεῶν ὀχήματα ἰσορρόπως εὐήνια ὄντα ῥᾳδίως πορεύεται, τὰ δὲ ἄλλα μόγις· βρίθει γὰρ ὁ τῆς κάκης ἵππος μετέχων, ἐπὶ τὴν γῆν ῥέπων τε καὶ βαρύνων, ᾧ μὴ καλῶς ᾖ τεθραμμένος τῶν ἡνιόχων.

1. (*a*) Into what sections is the Apology divided? Summarize the arguments.

(*b*) What do the Laws say to Socrates in the Crito?

3. How does Plato use:—

Ἄλλο τι, κινδυνεύω, ἐπιστάτης, ἐπιεικῶς.

CLASSICAL HONOURS—THIRD AND FOURTH YEARS.

SOPHOCLES, *Œdipus Coloneus.*

SATURDAY, MARCH 31ST:—MORNING, 9 TO 12.

1. Translate and comment on:—

(*a*) ΟΙ. ἆρ' ἄν τις αὐτῷ πομπὸς ἐξ ὑμῶν μόλοι;
ΞΕ. ὡς πρὸς τί λέξων ἢ καταρτύσων μολεῖν;
ΟΙ. ὡς ἂν προσαρκῶν σμικρὰ κερδάνῃ μέγα.

L and others ἆρ' οὖν. L and others μόλοι.

(*b*) σιγήσομαί τε καὶ σύ μ' ἐξ ὁδοῦ πόδα
κρύψον κατ' ἄλσος, τῶνδ' ἕως ἂν ἐκμάθω
τίνας λόγους ἐροῦσιν. ἐν γὰρ τῷ μαθεῖν
ἔνεστιν ἡ ὑλάβεια τῶν ποιουμένων.

(*c*) ΧΟ. οὐδενὶ μοιριδία τίσις ἔρχεται
ὧν προπάθῃ τὸ τίνειν·
ἀπάτα δ' ἀπάταις ἑτέραις ἑτέρα
παραβαλλομένα πόνον, οὐ χάριν, ἀντιδίδωσιν
ἔχειν.

(*d*) οὐ δῆτ', ἐπεί τοι τὴν μὲν αὐτίχ' ἡμέραν
ὁπηνίκ' ἔζει θυμός, ἥδιστον δέ μοι
τὸ κατθανεῖν ἦν καὶ τὸ λευσθῆναι πέτροις,
οὐδεὶς ἔρωτ' ἐς τόνδ' ἐφαίνετ' ὠφελῶν·
χρόνῳ δ', ὅτ' ἤδη πᾶς ὁ μόχθος ἦν πέπων,
κἀμάνθανον τὸν θυμὸν ἐκδραμόντα μοι
μείζω κολαστὴν τῶν πρὶν ἡμαρτημένων,
τὸ τηνίκ' ἤδη τοῦτο μὲν πόλις βίᾳ
ἤλαυνέ μ' ἐκ γῆς χρόνιον, οἱ δ' ἐπωφελεῖν,
οἱ τοῦ πατρὸς τῷ πατρί, δυνάμενοι τὸ δρᾶν
οὐκ ἠθέλησαν, ἀλλ' ἔπους σμικροῦ χάριν
φυγάς σφιν ἔξω πτωχὸς ἠλώμην ἀεί.

Mss. ἔρωτος τοῦδ'
L ἀεί. A and most Mss. ἐγώ.

(*e*) OI. ἐδεξάμην
δῶρον, ὃ μήποτ' ἐγὼ ταλακάρδιος
ἐπωφελήσας πόλεος ἐξελέσθαι.

(*f*) ἔστιν δ' οἷον ἐγὼ γᾶς Ἀσίας οὐκ ἐπακούω,
οὐδ' ἐν τᾷ μεγάλᾳ Δωρίδι νάσῳ Πέλοπος πώποτε βλαστὸν
φύτευμ' ἀχείρωτον αὐτοποιόν,
ἐγχέων φόβημα δαΐων,
ὃ τᾷδε θάλλει μέγιστα χώρᾳ,
γλαυκᾶς παιδοτρόφου φύλλον ἐλαίας·
τὸ μέν τις οὐ νεαρὸς οὐδὲ γήρᾳ
συνναίων ἁλιώσει χερὶ πέρσας· ὁ γὰρ αἰὲν ὁρῶν κύκλος
λεύσσει νιν Μορίου Διὸς
χἁ γλαυκῶπις Ἀθάνα.
ἄλλον δ' αἶνον ἔχω ματροπόλει τᾷδε κράτιστον,
δῶρον τοῦ μεγάλου δαίμονος, εἰπεῖν, χθονὸς αὔχημα μέγιστον.

εὔιππον, εὔπωλον, εὐθάλασσον.
ὦ παῖ Κρόνου, σὺ γάρ νιν εἷς
τόδ' εἶσας αὔχημ', ἄναξ Ποσειδάν,
ἵπποισιν τὸν ἀκεστῆρα χαλινὸν
πρώταισι ταῖσδε κτίσας ἀγυιαῖς.
ἁ δ' εὐήρετμος ἔκπαγλ' ἁλία χερσὶ παραπτομένα
πλάτα
θρῴσκει, τῶν ἑκατομπόδων
Νηρῄδων ἀκόλουθος.

Mss. οὔτε νεαρὸς οὔτε γήρᾳ σημαίνων | εἰσαιὲν ὁρῶν | εἰπεῖν αὔχημα.

Give a metrical scheme of this passage.

(*g*) ΧΟ. ὁ ξεῖνος, ὦναξ, χρηστός· αἱ δὲ συμφοραὶ
αὐτοῦ πανώλεις, ἄξιαι δ' ἀμυναθεῖν.
ΘΗ. ἅλις λόγων· ὡς οἱ μὲν ἐξειργασμένοι
σπεύδουσιν, ἡμεῖς δ' οἱ παθόντες ἔσταμεν.
ΚΡ. τί δῆτ' ἀμαυρῷ φωτὶ προστάσσεις ποεῖν;
ΘΗ. ὁδοῦ κατάρχειν τῆς ἐκεῖ, πομπὸν δ' ἐμὲ
χωρεῖν, ἵν', εἰ μὲν ἐν τόποισι τοῖσδ' ἔχεις
τὰς παῖδας ἡμῖν, αὐτὸς ἐκδείξῃς ἐμοί.

Mss. ἐξηρπασμένοι (v. l. ην) | παῖδας ἡμῶν.

(*h*) ΧΟ. ὅστις τοῦ πλέονος μέρους χρῄζει τοῦ μετρίου
παρεὶς.
ζώειν, σκαιοσύναν φυλάσσων ἐν ἐμοὶ κατάδηλος
ἔσται.
ἐπεὶ πολλὰ μὲν αἱ μακραὶ ἀμέραι κατέθεντο δὴ
λύπας ἐγγυτέρω, τὰ τέρποντα δ' οὐκ ἂν ἴδοις ὅπου,
ὅταν τις ἐς πλέον πέσῃ
τοῦ δέοντος· ὁ δ' ἐπίκουρος ἰσοτέλεστος,
Ἄϊδος ὅτε μοῖρ' ἀνυμέναιος

ἄλυρος ἄχορος ἀναπέφηνε,
θάνατος ἐς τελευτάν.

Mss. τοῦ θέλοντος.

(*i*) XO. νέα τάδε νεόθεν ἦλθέ μοι
κακὰ βαρύποτμα παρ' ἀλαοῦ ξένου,
εἴ τι μοῖρα μὴ κιγχάνει.
ματᾶν γὰρ οὐδὲν ἀξίωμα δαιμόνων ἔχω φράσαι.
ὁρᾷ ὁρᾷ ταῦτ' ἀεὶ χρόνος, στρέφων μὲν ἕτερα,
τὰ δὲ παρ' ἦμαρ αὖθις αὔξων ἄνω.

Mss. μάτην γὰρ | χρόνος, ἐπεὶ μὲν ἕτερα.

(*k*) ἐπεὶ δὲ παντὸς εἶχε δρῶντος ἡδονήν,
κοὐκ ἦν ἔτ' οὐδὲν ἀργὸν ὧν ἐφίετο,
κτύπησε μὲν Ζεὺς χθόνιος, αἱ δὲ παρθένοι
ῥίγησαν ὡς ἤκουσαν· ἐς δὲ γούνατα
πατρὸς πεσοῦσαι κλαῖον, οὐδ' ἀνίεσαν
στέρνων ἀραγμοὺς οὐδὲ παμμήκεις γόους.

2. Discuss the following Mss. readings :—

(*a*) καὶ μὴ θεοὺς τιμῶντες εἶτα τοὺς θεοὺς
μοίραις ποιεῖσθε μηδαμῶς.

(*b*) πρὶν μὲν γὰρ αὐτοῖς ἦν ἔρις Κρέοντί τε
θρόνους ἐᾶσθαι μηδὲ χραίνεσθαι πόλιν.

(*c*) ἐὰν γὰρ ὑμεῖς, ὦ ξένοι, θέλητέ μου
πρὸ σταῖσι ταῖς σεμναῖσι δημούχοις θεαῖς
ἀλκὴν ποιεῖσθαι. . .

L_2 μοι
F πρὸς ταῖσι ταῖς A σὺν ταῖσδε ταῖς.

(*d*) ὀιὸς νεαρᾶς νεοπόκῳ μαλλῷ λαβών.

(*e*) ἤνεγκον κακότατ', ὦ ξένοι, ἤνεγκον ἄκων μέν, θεὸς ἴστω.

τουτων δ' αὐθαίρετον οὐδέν.
(In strophé δεινὸν μὲν τὸ πάλαι κειμένον ἤδη κακόν, ὦ ξεῖν', ἐπεγείρειν.)

(*f*) καὶ γὰρ ἄλλους ἐφόνευσα καὶ ἀπώλεσα.

(*g*) πᾶσα δ' ὁρμᾶται κατ'
ἀμπυκτήρια φάλαρα πώλων
ἄμβασις.
(In strophé προσπόλων Εὐμολπιδᾶν.
ἔνθ' οἶμαι τὸν ἐγρεμάχαν (v. l. ὀρειβάταν)
Θησέα).

(*h*) ὡς εὖτ' ἂν τὸ νέον παρῇ κούφας ἀφροσύνας φέρων
(v. l. φέρον)
τίς πλάγχθη πολύμοχθος ἔξω ; τίς οὐ καμάτων ἔνι ;

(*i*) δός μοι χερὸς σῆς πίστιν ἀρχάιαν τέκνοις.

3. Discuss (*a*) the successive positions of Oedipus at the grove, (*b*) the locality of the rescue.

4. Mention the oracles and legends alluded to in this play.

CLASSICAL HONOURS—THIRD AND FOURTH YEARS.

TRANSLATION AT SIGHT.

FRIDAY, APRIL 6TH:—AFTERNOON, 2 TO 5.

A.—THIRD AND FOURTH YEARS.

(1) Ὡς δ' ὅτε κάπριον ἀμφὶ κύνες θαλεροί τ' αἰζηοὶ
σεύωνται, ὁ δέ τ' εἶσι βαθείης ἐκ ξυλόχοιο,
θήγων λευκὸν ὀδόντα μετὰ γναμπτῇσι γένυσσιν·
ἀμφὶ δέ τ' ἀΐσσονται· ὑπαὶ δέ τε κόμπος ὀδόντων
γίγνεται· οἱ δὲ μένουσιν ἄφαρ, δεινόν περ ἐόντα·

ὣς ῥα τότ' ἀμφ' Ὀδυσῆα Διὶ φίλον ἐσσεύοντο
Τρῶες· Ὁ δὲ πρῶτον μὲν ἀπύμονα Δηϊοπίτην
οὔτασεν ὦμον ὕπερθεν ἐπάλμενος ὀξέϊ δουρί.

(2) ΧΟ. σὺ τὰς θεῶν ἄκαμπτον φρένα καὶ βροτῶν
ἄγεις, Κύπρι· σὺν δ'
ὁ ποικιλόπτερος ἀμφιβαλὼν
ὠκυτάτῳ πτερῷ.
ποταῖται δ' ἐπὶ γαῖαν εὐάχητόν θ'
ἁλμυρὸν ἐπὶ πόντον.
θέλγει δ' Ἔρως, ᾧ μαινομένᾳ κραδίᾳ
πτανὸς ἐφορμάσῃ
χρυσοφαὴς, φύσιν
ὀρεσκόων σκυλάκων
πελαγίων θ' ὅσα τε γᾶ τρέφει,
τὰν Ἅλιος αἰθομέναν δέρκεται,
ἄνδρας τε· συμπάντων δὲ
βασιληίδα τιμὰν, Κύπρι,
τῶνδε μόνα κρατύνεις.

(3) ὑμῶν δὲ οὐδ' ἡ ἀπειρία τοσοῦτον λείπεται ὅσον τόλμῃ προέχετε· τῶνδε δὲ ἡ ἐπιστήμη, ἣν μάλιστα φοβεῖσθε, ἀνδρείαν μὲν ἔχουσα καὶ μνήμην ἕξει ἐν τῷ δεινῷ ἐπιτελεῖν ἃ ἔμαθεν, ἄνευ δὲ εὐψυχίας οὐδεμία τέχνη πρὸς τοὺς κινδύνους ἰσχύει. φόβος γὰρ μνήμην ἐκπλήσσει, τέχνη δὲ ἄνευ ἀλκῆς οὐδὲν ὠφελεῖ. πρὸς μὲν οὖν τὸ ἐμπειρότερον αὐτῶν τὸ τολμηρότερον ἀντιτάξασθε, πρὸς δὲ τὸ διὰ τὴν ἧσσαν δεδιέναι τὸ ἀπαράσκευοι τότε τυχεῖν. περιγίγνεται δὲ ὑμῖν πλῆθός τε νεῶν καὶ πρὸς τῇ γῇ οἰκείᾳ οὔσῃ ὁπλιτῶν παρόντων ναυμαχεῖν· τὰ δὲ πολλὰ τῶν πλειόνων καὶ ἄμεινον παρεσκευασμένων τὸ κράτος ἐστίν. ὥστε οὐδὲ καθ' ἓν εὑρίσκομεν εἰκότως ἂν ἡμᾶς σφαλλομένους· καὶ ὅσα ἡμάρτομεν πρότερον, νῦν αὐτὰ ταῦτα προσγενόμενα διδασκαλίαν παρέξει.

(4) Οὗτος δὴ ἑκατέρου τρόπος, ὦ Θεόδωρε, ὁ μὲν τῷ ὄντι ἐν ἐλευθερίᾳ τε καὶ σχολῇ τεθραμμένου, ὃν δὴ φιλόσοφον καλεῖς, ᾧ ἀνεμέσητον εὐήθει δοκεῖν καὶ οὐδενὶ εἶναι, ὅταν εἰς δουλικὰ ἐμπέσῃ διακονήματα, οἷον στρωματόδεσμον μὴ ἐπισταμένου συσκευάσασθαι μηδὲ ὄψον ἡδῦναι ἢ θῶπας λόγους· ὁ δ' αὖ τὰ μὲν τοιαῦτα πάντα δυναμένου τορῶς τε καὶ ὀξέως διακονεῖν, ἀναβάλλεσθαι δὲ οὐκ ἐπισταμένου ἐπιδέξια ἐλευθέρως οὐδέ γ' ἁρμονίαν λόγων λαβόντος ὀρθῶς ὑμνῆσαι θεῶν τε καὶ ἀνδρῶν εὐδαιμόνων βίον ἀληθῆ.

B.—FOR THIRD YEAR ONLY.

(a) Καὶ οἱ Βοιωτοὶ εὐθὺς μεταπεμψάμενοι ἔκ τε τοῦ Μηλιέως κόλπου ἀκοντιστὰς καὶ σφενδονήτας καὶ βεβοηθηκότων αὐτοῖς μετὰ τὴν μάχην Κορινθίων τε δισχιλίων ὁπλιτῶν καὶ τῶν ἐκ Νισαίας ἐξεληλυθότων Πελοποννησίων φρουρῶν καὶ Μεγαρέων ἅμα ἐστράτευσαν ἐπὶ τὸ Δήλιον καὶ προσέβαλον τῷ τειχίσματι, ἄλλῳ τε τρόπῳ πειράσαντες καὶ μηχανὴν προσήγαγον, ἥπερ εἶλεν αὐτό, τοιάνδε. κεραίαν μεγάλην δίχα πρίσαντες ἐκοίλαναν ἅπασαν, καὶ ξυνήρμοσαν πάλιν ἀκριβῶς ὥσπερ αὐλόν, καὶ ἐπ' ἄκραν λέβητά τε ἤρτησαν ἁλύσεσι καὶ ἀκροφύσιον ἀπὸ τῆς κεραίας σιδηροῦν ἐς αὐτὸν νεῦον καθεῖτο, καὶ ἐσεσιδήρωτο ἐπὶ μέγα καὶ τοῦ ἄλλου ξύλου. προσῆγον δὲ ἐκ πολλοῦ ἁμάξαις τῷ τείχει, ᾗ μάλιστα τῇ ἀμπέλῳ καὶ τοῖς ξύλοις ᾠκοδόμητο· καὶ ὁπότε εἴη ἐγγύς, φύσας μεγάλας ἐσθέντες ἐς τὸ πρὸς ἑαυτῶν ἄκρον τῆς κεραίας ἐφύσων.

C.—FOR FOURTH YEAR ONLY.

(1) Τίκτει δέ τε θνατοῖσιν εἰράνα μεγάλα
πλοῦτον καὶ μελιγλώσσων ἀοιδᾶν ἄνθεα,
δαιδαλέων τ' ἐπὶ βωμῶν θεοῖσιν αἴθεσθαι βοῶν
ξανθᾷ φλογὶ μῆρα τανυτρίχων τε μήλων,

γυμνασίων τε νέοις αὐλῶν τε καὶ κώμων μέλειν.
Ἐν δὲ σιδαροδέτοις πόρπαξιν αἰθᾶν
ἀραχνᾶν ἱστοὶ πέλονται·
ἔγχεά τε λογχωτὰ ξίφεά τ' ἀμφάκεα δάμναται
εὐρώς·
χαλκεᾶν δ' οὐκ ἔστι σαλπίγγων κτύπος·
οὐδὲ συλᾶται μελίφρων ὕπνος ἀπὸ βλεφάρων,
ἀμὸν ὃς θάλπει κέαρ
συμποσίων δ' ἐρατῶν βρίθοντ' ἀγυιαί, παιδικοί θ'
ὕμνοι φλέγονται.

(2) οἰκεῦσι δὲ τοιοῦτον τρόπον· κρατέων ἕκαστος ἐπὶ τῶν ἰκρίων καλύβης τε ἐν ᾗ διαιτᾶται, καὶ θύρης καταπακτῆς διὰ τῶν ἰκρίων κάτω φερούσης ἐς τὴν λίμνην. τὰ δὲ νήπια παιδία δέουσι τοῦ ποδὸς σπάρτῳ, μὴ κατακυλισθῇ δειμαίνοντες. τοῖσι δὲ ἵπποισι καὶ τοῖσι ὑποζυγίοισι παρεχουσι χόρτον ἰχθῦς. τῶν δὲ πλῆθός ἐστι τοσοῦτον, ὥστε ὅταν τὴν θύρην τὴν καταπακτὴν ἀνακλίνῃ, κατίει σχοίνῳ σπυρίδα κεινὴν ἐς τὴν λίμνην· καὶ οὐ πολλόν τινα χρόνον ἐπισχὼν, ἀνασπᾷ πλήρεα ἰχθύων.

B.A. CLASSICAL HONOURS.

SOPHOCLES, ARISTOPHANES, THEOCRITUS AND ARISTOTLE.

SATURDAY, MARCH 31ST:—AFTERNOON, 2 TO 5.

A.—SOPHOCLES, TRACHINIAE

1. Translate, with notes on words and phrases underlined:—

(a) ὧν ἐπιμεμφομένα σ' αἰδοῖα μέν, ἀντία δ' οἴσω.
φαμὶ γὰρ οὐκ ἀποτουεῖν ἐλπίδα τὰν ἀγαθὰν

χρῆναί σ'· ἀνάλγητα γὰρ οὐδ' ὁ πάντα κραίνων
Βασιλεὺς ἐπέβαλε θνατοῖς Κρονίδας·
ἀλλ' ἐπὶ πῆμα καὶ χαρὰ πᾶσι κυκλοῦσιν, οἷον
ἄρκτου στροφαδες κελευθοι.

Mss. ἀδεῖα.

(β) φωνεῖ δέ, δοῦλος ἀνδρὸς ὡς ἐλευθέρου
ῥαίοιτο· δείπνοις δ', ἡνίκ' ἦν ᾠνωμένος,
ἔρριψεν ἐκτὸς αὐτόν. ὃν ἔχων χόλον,
ὡς ἵκετ' αὖθις Ἰφιτος Τιρυνθίαν
πρὸς κλιτύν, ἵππους νομάδας ἐξιχνοσκοπῶν,
τότ' ἄλλοσ' αὐτὸν ὄμμα, θατέρᾳ δὲ νοῦν
ἔχοντ' ἀπ' ἄκρας ἧκε πυργώδους πλακός.

(γ) ἀφίκοιτ' ἀφίκοιτο· μὴ σταίη
πολύκωπον ὄχημα ναὸς αὐτῷ,
πρὶν τάνδε πρὸς πόλιν ἀνύσειε,
νασιῶτιν ἑστίαν
ἀμείψας, ἔνθα κλῄζεται θυτήρ·
ὅθεν μόλοι πανίμερος,
τᾶς πειθοῦ παγχρίστῳ
συγκραθεὶς ἐπὶ προφάσει φάρους.

Mss. πανάμερος | θηρός.

(δ) πλευραῖσι γὰρ προσμαχθὲν ἐκ μὲν ἐσχάτας
βέβρωκε σάρκας, πλεύμονός τ' ἀρτηρίας
ῥοφεῖ ξυνοικοῦν· ἐκ δὲ χλωρὸν αἷμά μου
πέπωκεν ἤδη, καὶ διέφθαρμαι δέμας
τὸ πᾶν, ἀφράστῳ τῇδε χειρωθεὶς πέδῃ.
κοὐ ταῦτα λόγχη πεδιάς, οὔθ' ὁ γηγενὴς
στρατὸς Γιγάντων οὔτε θήρειος βία,
οὔθ' Ἕλλὰς οὔτ' ἄγλωσσος οὔθ' ὅσην ἐγὼ
γαῖαν καθαίρων ἱκόμην, ἔδρασέ πω·

γυνὴ δέ, θῆλυς φῦσα κοὐκ ἀνδρὸς φύσιν,
μόνη με δὴ καθεῖλε φασγάνου δίχα.

B.—ARISTOPHANES, WASPS.

1. Translate, with notes on words underlined :—

(a) ἀλλ', ὦγάθ', ἀνίστασο μηδ' οὕτω σεαυτὸν ἔσθιε, μηδ' ἀγανάκτει.
καὶ γὰρ ἀνὴρ παχὺς ἥκει τῶν προδόντων τἀπὶ Θρᾴκης·
ὃν ὅπως ἐγχυτριεῖς.

(b) οἱ δὲ ξύμμαχοι ὥς σ' ᾔσθηνται καὶ τὸν σύρφακα τὸν ἄλλον
ἐκ κηθαρίου λαγαριζόμενον καὶ τραγαλίζοντα τὸ μηδέν,
σὲ μὲν ἡγοῦνται Κόννου ψῆφον, τούτοισι δὲ δωροφορῳ̂σιν
ὕρχας, οἶνον, δάπιδας, τυρόν, μέλι, σήσαμα, προσκεφάλαια,
φιάλας, χλανίδας, στεφάνους, ὅρμους, ἐκπώματα, πλουθυγίειαν·
σοὶ δ' ὧν ἄρχεις π ο λ λ ὰ μ ὲ ν ἐ ν γ ῇ, π ο λ λ ὰ δ' ἐ φ' ὑ γ ρ ᾷ π ι τ υ λ ε ύ σ α ς,
οὐδεὶς οὐδὲ σκορόδου κεφαλὴν τοῖς ἑψητοῖσι δίδωσιν.

(c) ΦΙΛ. αἴσχιστα γάρ τοί μ' ἠργάσατο Λυσίστρατος
ὁ σκωπτόλης. δραχμὴν μετ' ἐμοῦ πρῴην λαβών,
ἐλθὼν διεκερματίζετ' ἐν τοῖς ἰχθύσιν,
κἄπειτ' ἐπέθηκε τρεῖς λοπίδας μοι κεστρέων·
κἀγὼ 'νέκαψ'· ὀβολοὺς γὰρ ᾠόμην λαβεῖν·
κᾆτα βδελυχθεὶς ὀσφρόμενος ἐξέπτυσα·
κᾆθ' εἷλκον αὐτόν.

ΒΔΕ. ὁ δὲ τί πρὸς ταῦτ' εἶφ' ;
ΦΙΛ. ὅ τι ;
ἀλεκτρυόνος μ ἔφασκε κοιλίαν ἔχειν·
ταχὺ γοῦν καταπέψεις τἀργύριον, ἢ δ' ὃς γελῶν.

(*d*) τοιοῦτον ἰδὼν τέρας οὗ φησιν δείσας καταδωροδοκῆσαι,
ἀλλ' ὑπὲρ ὑμῶν ἔτι καὶ νυνὶ πολεμεῖ· φησίν τε μετ' αὐτὸν
τοῖς ἠπιάλοις ἐπιχειρῆσαι πέρυσιν καὶ τοῖς πυρετοῖσιν,
οἳ τοὺς πατέρας τ' ἦγχον νύκτωρ καὶ τοὺς πάππους ἀπέπνιγον,
κατακλινόμενοί τ' ἐπὶ ταῖς κοίταις ἐπὶ τοῖσιν ἀπράγμοσιν ὑμῶν
ἀντωμοσίας καὶ προσκλήσεις καὶ μαρτυρίας συνεκόλλων,
ὥστ' ἀναπηδᾶν δειμαίνοντας πολλοὺς ὡς τὸν πολέμαρχον.

(*e*) καὶ σὺ δή μοι, Χαιρεφῶν,
γυναικὶ κλητεύων, ἔοικας θαψίνῃ
Ἰνοῖ κρεμαμένῃ πρὸς ποδῶν—Εὐριπίδου.

2. Give some account of the general scheme of a Greek Comedy and of the place occupied by Aristophanes in the development of Comedy.

C.—THEOCRITUS.

Translate:—

(1) οἳ δ' ὑπ' ἔρωτος
δηθὰ κυλοιδιόωντες ἐτώσια μοχθίζοντι.

(2) Τὰν ὀλίγος τις κῶρος ἐφ' αἱμασιαῖσι φυλάσσει
ἥμενος· ἀμφὶ δέ νιν δύ' ἀλώπεκες, ἃ μὲν ἀν' ὄρχως
φοιτῇ σινομένα τὰν τρώξιμον, ἃ δ' ἐπὶ πήρᾳ
πάντα δόλον κεύθοισα τὸ παιδίον οὐ πρὶν ἀνησεῖν
φατὶ πρὶν ἢ ἀκράτιστον ἐπὶ ξηροῖσι καθίξῃ,
αὐτὰρ ὅγ' ἀνθερίκοισι καλὰν πλέκει ἀκριδοθήραν
σχοίνῳ ἐφαρμόσδων· μέλεται δὲ οἱ οὔτέ τι πήρας
οὔτε φυτῶν τοσσῆνον, ὅσον περὶ πλέγματι γαθεῖ.

(3) Σάυραν τοι τρίψασα κακὸν ποτὸν αὔριον οἰσῶ.
Θέστυλι, νῦν δὲ λαβοῖσα τυ τὰ θρόνα ταῦθ' ὑπόμα-
ξον
τᾶς τήνω φλιᾶς καθυπερτέρω ἃς ἔτι καὶ νῦν
ἐκ θυμῶ δέδεμαι· ὁ δέ μευ λόγον οὐδνα ποιεῖ·
καὶ λέγ' ἐπιφθύζοισα· τὰ Δέλφιδος ὄστια μάσσω.

(4) Ὤμοι ὅτ' οὐκ ἔτεκέν μ' ἁ μάτηρ βράγχι' ἔχοντα
ὡς κατέδυν ποτὶ τὶν καὶ τὰν χέρα τεῦς ἐφίλησα,
αἰ μὴ τὸ στομ' ἔλης, ἔφερον δέ τοι ἢ κρίνα λευκά
ἢ μάκων' ἁπάλαν ἐρυθρὰ πλαταγώνι' ἔχοισαν.

(5) ταῦθ' ὁ πάραρος τῆνος· ἐπ' ἔσχατα γᾶς ἔλαβ' ἐνθῶν
εἰλεόν οὐκ οἴκησιν.

(6) Πεινᾶντι δὲ μηδὲ ποτένθῃ

D.—ARISTOTLE, ETHICS I, II, X

1. Translate and explain in reference to the context in each case :—

(*a*) δῆλον οὖν ὅτι διττῶς λέγοιτ' ἂν τἀγαθά, καὶ τὰ μὲν καθ' αὑτά, θάτερα δὲ διὰ ταῦτα. χωρίσαντες οὖν ἀπὸ τῶν ὠφελίμων τὰ καθ' αὑτὰ σκεψώμεθα εἰ λέγεται κατὰ μίαν ἰδέαν. καθ' αὑτὰ δὲ ποῖα θείη τις ἄν; ἢ ὅσα καὶ μονούμενα διώκεται, οἷον τὸ φρονεῖν καὶ ὁρᾶν καὶ ἡδοναί τινες

καὶ τιμαί; ταῦτα γὰρ εἰ καὶ δι' ἄλλο τι διώκομεν, ὅμως τῶν καθ' αὑτὰ ἀγαθῶν θείη τις ἄν. ἢ οὐδ' ἄλλο οὐδὲν πλὴν τῆς ἰδέας; ὥστε μάταιον ἔσται τὸ εἶδος.

(*b*) εἰ δ' οὕτως, ἄθλιος μὲν οὐδέποτε γένοιτ' ἂν ὁ εὐδαίμων, οὐ μὴν μακάριός γε, ἂν Πριαμικαῖς τύχαις περιπέσῃ. οὐδὲ δὴ ποικίλος γε καὶ εὐμετάβολος· οὔτε γὰρ ἐκ τῆς εὐδαιμονίας κινηθήσεται ῥᾳδίως, οὐδ' ὑπὸ τῶν τυχόντων ἀτυχημάτων ἀλλ' ὑπὸ μεγάλων καὶ πολλῶν.

(*c*) νέμεσις δὲ μεσότης φθόνου καὶ ἐπιχαιρεκακίας, εἰσὶ δὲ περὶ λύπην καὶ ἡδονὴν τὰς ἐπὶ τοῖς συμβαίνουσι τοῖς πέλας γινομένας· ὁ μὲν γὰρ νεμεσητικὸς λυπεῖται ἐπὶ τοῖς ἀναξίως εὖ πράττουσιν, ὁ δὲ φθονερὸς ὑπερβάλλων τοῦτον ἐπὶ πᾶσι λυπεῖται, ὁ δ' ἐπιχαιρέκακος τοσοῦτον ἐλλείπει τοῦ λυπεῖσθαι ὥστε καὶ χαίρειν.

(*d*) ἡ γὰρ τῶν λίθων σύνθεσις ἑτέρα τῆς τοῦ κίονος ῥαβδώσεως, καὶ αὗται τῆς τοῦ ναοῦ ποιήσεως· καὶ ἡ μὲν τοῦ ναοῦ τελεία (οὐδενὸς γὰρ ἐνδεὴς πρὸς τὸ προκείμενον), ἡ δὲ τῆς κρηπῖδος καὶ τοῦ τριγλύφου ἀτελής· μέρους γὰρ ἑκατέρα.

2. (*a*) Summarize the steps by which Aristotle is led to his definition of the chief end of man.

(*b*) In what ways is The Speculative Life superior.

B.A. CLASSICAL HONOURS.

GENERAL PAPER.

THURSDAY, APRIL 5TH:—AFTERNOON, 2 TO 5.

A.—GRAMMAR AND PHILOLOGY.

1. Explain the use of the negatives in:—

(*a*) οὔτ' ἂν δυναίμην μήτ' ἐπισταίμην λέγειν.

(*b*) ὅτ' οὐδὲν ὢν τοῦ μηδὲν ἀντέστης ὕπερ.

(*c*) εἰ. . . . οὐκ ἀρκέσει.

(*d*) διὰ τὴν οὐ περιτείχισιν.

(*e*) μὴ τεχνησάμενος μηδ' ἄλλο τι τεχνήσαιτο.

2. Compare the Latin and Greek languages in respect of:—

(*a*) The use of the relative pronoun.

(*b*) The use of the infinitive mood.

3. Explain the original meaning and the usage of the particle ἂν (κεν). What are the main differences between Homeric and Attic Greek in this respect?

4. Express the following dates according to our notation: A.D. IV. Non. Sextiles, C. Terentio Varrone L. Aemilio Paullo II. cos.; A.D. VIII. Kal. Apr. Cn. Pompeio Magno M. Licinio Crasso cos.; prid. Id. Jan. A. U. C. CCCCXL. Write the following in Latin: June 20th, B. C. 207; Nov. 8th, B. C. 63.

5. Connect etymologically the following with any corresponding Greek or Latin word:—ἕπομαι, ὄψ, vetus, suavis, sunt, θύρα, ὁδούς, venio, κρίνω, vicus, ἐρυθρόν, Aurora.

6. Give illustrations in Greek or Latin of compensatory lengthening, assimilation of vowels, parasitic vowels, regressive assimilation of two consonants, disappearance of syllables by dissimulation.

B.—GREEK AND ROMAN LITERATURE.

N.B.—Not more than *four* questions to be attempted.

1. Compare briefly the theological views of Homer with those of Aeschylus.

2. Compare the hexameter in the hands of Lucretius, Virgil and Ovid.

3. Criticise briefly the poetry of Tibullus, *or* Martial, *or* Theocritus.

4. Account for the decay of Roman literature in the 3rd century.

5. Enumerate the Attic orators with some brief notes on their style.

6. Enumerate some of the principal Elegiac poets of Greece with a brief account of their works.

C.—HISTORY AND ANTIQUITIES.

Not more than *six* questions to be attempted.

1. Contrast the periods of Athenian and Spartan Empire in Greece.

2. Summarise briefly the steps by which Philip established his ascendancy in Greece. To what extent was the downfall of Athens due to causes already existing in the time of Pericles?

3. Describe generally the arrangements for the production of a Greek play. What are the meanings of:—*περιπέτεια, ὑπόρχημα, πάροδος, ἐκκύκλημα, μηχανή.*

4. Compare an Athenian *δικαστήριον* and an English jury in respect of composition, functions and principles of judgment.

5. Explain the meanings of:—*ἕεδνα, ἔνη καὶ νέα, ἐπίδοσις, ἐπωβελία, ἔφηβος. θαλαμίτης, κανηφόροι, παράβασις, πεταλισμός, σκυτάλη, προστάτης, ταξίαρχος, συσσίτιον.*

6. Describe the part played by the Equites in the history of Rome.

7. Trace the effect of the changes introduced by Marius into the organization of the army.

8. Give an outline of Agrarian Legislation at Rome down to the time of J. Caesar.

9. Sketch the course of the events which led to the incorporation of Greece in the Roman Empire.

10. How did the institution of the Empire affect (*a*) the provinces, (*b*) the army?

B.A. CLASSICAL HONOURS.

HERODOTUS, DEMOSTHENES, AND ATTIC ORATORS.

MONDAY, APRIL 9TH:—MORNING, 9 TO 12.

(A, B and C to be shown up in separate books.)

A.—HERODOTUS VII.

Translate with comments:—

1. ἴσον ἐκεῖνο, ὦ βασιλεῦ, παρ' ἐμοὶ κέκριται, φρονέειν τε εὖ καὶ τῷ λέγοντι χρηστὰ ἐθέλειν πείθεσθαι· τὰ σὲ καὶ ἀμφότερα περιήκοντα ἀνθρώπων κακῶν ὁμιλίαι σφάλλουσι, κατά περ τὴν πάντων χρησιμωτάτην ἀνθρώποισι θάλασσαν πνεύματα φασὶ ἀνέμων ἐμπίπτοντα οὐ περιορᾶν φύσει τῇ ἑωυτῆς χρῆσθαι.

2. ταῦτα δὲ ποιήσαντες κατέτειναν ἐκ γῆς στρεβλοῦντες ὄνοισι ξυλίνοισι τὰ ὅπλα, οὐκέτι χωρὶς ἑκάτερα τάξαντες, ἀλλὰ δύο μὲν λευκολίνου δασάμενοι ἐς ἑκατέρην, τέσσαρα δὲ τῶν βυβλίνων. παχύτης μὲν ἦν ἡ αὐτὴ καὶ καλλονή, κατὰ λόγον δὲ ἦν ἐμβριθέστερα τὰ λίνεα, τοῦ τάλαντον ὁ πῆχυς εἶλκε.

3. περὶ μὲν τῇσι κεφαλῇσι εἶχον τιάρας καλεομένους, πίλους ἐπαγέας, περὶ δὲ τὸ σῶμα κιθῶνας χειριδωτοὺς ποικίλους, λεπίδος σιδηρέης ὄψιν ἰχθυοειδέος, περὶ δὲ τὰ σκέλεα ἀναξυρίδας, ἀντὶ δὲ ἀσπίδων γέρρα.

4. ἡ δὲ γῆ αὕτη ἡ περὶ τὸ Πάγγαιον οὖρος καλέεται Φυλλὶς, κατατείνουσα ἐς αὐτὸν τὸν Στρυμόνα ἐς τὸν οἱ Μάγοι ἐκαλλιρέοντο σφάζοντες ἵππους λευκους.

5. οὕτω ἂν ὦν εἴημεν ὑμέτεροι ἀπόγονοι. οὔτε ὦν ἡμέας οἰκὸς ἐπὶ τοὺς ἡμετέρους προγόνους ἐκστρατεύεσθαι, οὔτε ὑμέας ἄλλοισι τιμωρέοντας ἡμῖν ἀντιξόους γενέσθαι, ἀλλὰ παρ' ὑμῖν αὐτοῖσι ἡσυχίην ἔχοντας κατῆσθαι. ἦν γὰρ ἐμοὶ γένηται κατὰ νόον, οὐδαμοὺς μέζονας ὑμέων ἄξω.

6. ἐπεί τε δὲ οἱ Μῆδοι τρηχέως περιείποντο, ἐνταῦθα οὗτοι μὲν ὑπεξήϊσαν, οἱ δὲ Πέρσαι ἐκδεξάμενοι ἐπήϊσαν, τοὺς ἀθανάτους ἐκάλεε βασιλεὺς, τῶν ἦρχε Ὑδάρνης, ὡς δὴ οὗτοί γε εὐπετέως κατεργασόμενοι.

7. Βρίγες — Πελασγοί — Ἀρτεμισίη — Μασκάμης — ἀδάμαντι πελάσσας — Τριτογενής.

8. Discuss the component parts of Xerxes' armament and the significance from an Indo-European standpoint of their ultimate defeat.

9. Give Herodotus' usage regarding (1) Aspirates.
(2) κ = Attic π.

B.—DEMOSTHENES, ADVERSUS LEPTINEM.

1. Translate and comment on :—

(a) ὁ τοίνυν τὴν πίστιν ἀφαιρῶν τῶν δωρειῶν νόμος, οὗτος, ᾧ μόνῳ κρείττους εἰσὶν αἱ παρ' ὑμῶν δωρειαί, τοῦτ' ἀφαιρεῖται. καίτοι τῶν ἁπασῶν ἧς ἄν τινος πολιτείας τὸ κομίζεσθαι τοὺς εὖνους τοῖς καθεστῶσιν χάριν ἐξέλῃς, οὐ μικρὰν φυλακὴν αὐτῶν ταύτην ἀφῃρηκὼς ἔσει.

(b) ἵν' οὖν τριάκοντ' ἄνθρωποι πλείους παρὰ πάντα τὸν χρόνον λῃτουργήσωσιν ἡμῖν τοὺς ἅπαντας ἀπίστως πρὸς ἡμᾶς αὐτοὺς διαθῶμεν; ἀλλ' ἴσμεν ἐκεῖνο δήπου, ὅτι λῃτουργήσουσιν μέν, ἅνπερ ἡ πόλις ᾖ, πολλοί, καὶ οὐκ ἐπιλείψουσιν, εὖ δὲ ποιεῖν ἡμᾶς οὐδεὶς ἐθελήσει, τοὺς πρότερον ποιήσαντας ἐὰν ἠδικημένους ἴδῃ. εἶεν. εἰ δὲ δὴ τὰ μάλιστ' ἐπέλειπον οἱ χορηγεῖν οἷοί τε, πρὸς Διὸς πότερον κρεῖττον ἦν εἰς συντέλειαν ἀγαγεῖν τὰς χορηγίας ὥσπερ τὰς τριηραρχίας, ἢ τοὺς εὐεργέτας ἀφελέσθαι τὰ δοθέντα; ἐγὼ μὲν ἐκεῖνο οἶμαι.

(c) ὃν μὲν οὖν τρόπον ὑμᾶς ἔχων πρὸς ἅπαντας Πελ-

6. What is Isokrates' interpretation (in περὶ Ἀντιδόσεως) of (1) πλεονεξία (2) ἄστυ? How far is the latter interpretation consistent with Etymology?

7. Translate with notes:—εἰ γὰρ ἀπέστη μόνον (ὥς φησι) τοῖν δυοῖν μεροῖν τοῦ κλήρου, ἀναμφισβήτητα δὲ μὴ ὡμολόγει παραδώσειν, τί ἐζημιοῦτο ἀφιστάμενος ὧν τιμὴν εἶχεν; οὐδὲ γὰρ πρὶν ἡττηθῆναι τὴν δίκην εἶχεν ὧν ἡμεῖς δικαζόμεθα, ἀλλ' οἱ παρὰ τούτου πριάμενοι καὶ θέμενοι, οἷς ἔδει αὐτὸν ἀποδόντα τὴν τιμὴν ἡμῖν τὰ μέρη ἀποδοῦναι.

8. Translate:—ἐμοὶ γάρ, ὦ ἄνδρες, λαχόντι τοῦ κλήρου τὴν δίκην οὔτε οὗτος ὁ νῦν ἐμὲ εἰσαγγέλλων ᾠήθη δεῖν παρακαταβάλλειν ὑπὲρ τοῦ παιδός, οὔτε οἱ Στρατίου παῖδες οἱ ταὐτὸ τῷ παιδὶ προσήκοντες, οὔτε δι' ἄλλο <ἢ ὅτι> οὐδὲν αὐτοῖς ἐνόμιζον προσήκειν τούτων τῶν χρημάτων· ἐπεὶ οὐδ' ἂν οὗτος νῦν ἐμοὶ πράγματα παρεῖχεν, εἰ τὰ τοῦ παιδὸς εἴων ἁρπάζειν καὶ μὴ ἠναντιούμην αὐτῷ.

CLASSICAL HONOURS.

THUCYDIDES VII.

SATURDAY, APRIL 14TH:—MORNING, 9 TO 12.

1. Translate and comment on:—

(a) ὁ δὲ Ἰετὰς τότε τι τεῖχος ἐν τῇ παρόδῳ τῶν Σικελῶν ἑλών, καὶ ξυνταξάμενος ὡς ἐς μάχην ἀφικνεῖται ἐς τὰς Ἐπιπολάς· καὶ ἀναβὰς κατὰ τὸν Εὐρύηλον, ᾗπερ καὶ οἱ Ἀθηναῖοι τὸ πρῶτον, ἐχώρει μετὰ τῶν Συρακοσίων ἐπὶ τὸ τείχισμα τῶν Ἀθηναίων. ἔτυχε δὲ κατὰ τοῦτο τοῦ καιροῦ ἐλθὼν ἐν ᾧ ἑπτὰ μὲν ἢ ὀκτὼ σταδίων ἤδη

ἀπετετελεστο τοῖς Ἀθηναίοις ἐς τὸν μέγαν λιμένα διπλοῦν τεῖχος, πλὴν κατὰ βραχύ τι τὸ πρὸς τὴν θάλασσαν (τοῦτο δ' ἔτι ᾠκοδόμουν)· τῷ δὲ ἄλλῳ <ἄνω> τοῦ κύκλου πρὸς τὸν Τρώγιλον ἐπὶ τὴν ἑτέραν θάλασσαν λίθοι τε παραβεβλημένοι τῷ πλέονι ἤδη ἦσαν, καὶ ἔστιν ἃ καὶ ἡμίεργα, τὰ δὲ καὶ ἐξειργασμένα κατελελειπτο. παρὰ τοσουτον μὲν Συράκουσαι ἦλθον κινδύνου.

(*b*) εἰ γὰρ ἀφαιρήσομέν τι καὶ βραχὺ τῆς τηρήσεως, τὰ ἐπιτήδεια οὐχ ἕξομεν, παρὰ τὴν ἐκείνων πόλιν χαλεπῶς καὶ νῦν ἐσκομιζόμενοι. τὰ δὲ πληρώματα διὰ τόδε ἐφθάρη τε ἡμῖν καὶ ἔτι νῦν φθείρεται, τῶν ναυτῶν [τῶν] μὲν διὰ φρυγανισμὸν καὶ ἁρπαγὴν μακρὰν καὶ ὑδρείαν ὑπὸ τῶν ἱππέων ἀπολλυμένων· οἱ δὲ θεράποντες, ἐπειδὴ ἐς ἀντίπαπαλα καθεστήκαμεν, αὐτομολοῦσι, καὶ οἱ ξένοι οἱ μὲν ἀναγκαστοὶ ἐσβάντες εὐθὺς κατὰ τὰς πόλεις ἀποχωροῦσιν, οἱ δὲ ὑπὸ μεγάλου μισθοῦ τὸ πρῶτον ἐπαρθέντες καὶ οἰόμενοι χρηματιεῖσθαι μᾶλλον ἢ μαχεῖσθαι, ἐπειδὴ παρὰ γνώμην ναυτικόν τε δὴ καὶ τἆλλα ἀπὸ τῶν πολεμίων ἀνθεστῶτα ὁρῶσιν, οἱ μὲν ἐπ' αὐτομολίας προφάσει ἀπέρχονται, οἱ δὲ ὡς ἕκαστοι δύνανται.

(*c*) ξυνανέπειθε δὲ καὶ ὁ Ἑρμοκράτης οὐχ ἥκιστα, τοῦ ταῖς ναυσὶ μὴ ἀθυμεῖν ἐπιχειρῆσαι πρὸς τοὺς Ἀθηναίους λέγων οὐδὲ ἀίδιον τῆς θαλάσσης ἔχειν, ἀλλ' ἠπειρώτας μᾶλλον τῶν Συρακοσίων ὄντας καὶ ἀναγκασθέντας ὑπὸ Μήδων ναυτικοὺς γενέσθαι. καὶ πρὸς ἄνδρας τολμηρούς, οἵους καὶ Ἀθηναίους, τοὺς ἀντιτολμῶντας χαλεπώτατους ἂν [αὐτοῖς] φαίνεσθαι.

Mss. ἐπιχειρήσειν.

(*d*) μάλιστα δ' αὐτοὺς ἐπίεζεν ὅτι δύο πολέμους ἅμα εἶχον, καὶ ἐς φιλονικίαν καθέστασαν τοιαύτην ἣν πρὶν

γενέσθαι ἠπίστησεν ἄν τις ἀκούσας, τό γ' ἄν, αὐτοὺς πολιορκουμένους ἐπιτειχισμῷ ὑπὸ Πελοποννησίων, μηδ' ὡς ἀποστῆναι ἐκ Σικελίας, ἀλλὰ ἐκεῖ Συρακούσας τῷ αὐτῷ τρόπῳ ἀντιπολιορκεῖν, πόλιν οὐδὲν ἐλάσσω αὐτήν γε καθ' αὑτὴν τῆς Ἀθηναίων, καὶ τὸν παράλογον τοσοῦτον ποιῆσαι τοῖς Ἕλλησι τῆς δυνάμεως καὶ τόλμης, ὅσον <οἱ μὲν> κατ' ἀρχὰς τοῦ πολέμου, οἱ μὲν ἐνιαυτόν, οἱ δὲ δύο, οἱ δὲ τριῶν γε ἐτῶν οὐεὶς πλείω χρόνον, ἐνόμιζον περιοίσειν αὐτούς, εἰ οἱ Πελοποννήσιοι ἐσβάλοιεν ἐς τὴν χώραν, οἱ δὲ ἔτει ἑπτακαιδεκάτῳ μετὰ τὴν πρώτην ἐσβολὴν ἦλθον ἐς Σικελίαν.

Mss. lack first οἱ μὲν and have ὥστε for last οἱ δὲ.

(*e*) ἐν δὲ νυκτομαχίᾳ ἡ μόνη δὴ στρατοπέδων μεγάλων ἔν γε τῷδε τῷ πολέμῳ ἐγένετο, πῶς ἄν τις σαφῶς τι ᾔδει; ἦν μὲν γὰρ σελήνη λαμπρά, ἑώρων δὲ οὕτως ἀλλήλους ὡς ἐν σελήνῃ εἰκὸς τὴν μὲν ὄψιν τοῦ σώματος προορᾶν, τὴν δὲ γνῶσιν τοῦ οἰκείου ἀπιστεῖσθαι. ὁπλῖται δὲ ἀμφοτέρων οὐκ ὀλίγοι ἐν στενοχωρίᾳ ἀνεστρέφοντο. καὶ τῶν Ἀθηναίων οἱ μὲν ἤδη ἐνικῶντο, οἱ δὲ ἔτι τῇ πρώτῃ ἐφόδῳ ἀήσσητοι ἐχώρουν. πολὺ δὲ καὶ τοῦ ἄλλου στρατεύματος αὐτοῖς τὸ μὲν ἄρτι ἀνεβεβήκει, τὸ δ' ἔτι προσανῄει, ὥστ' οὐκ ἠπίσταντο πρὸς ὅ τι χρὴ χωρῆσαι. ἤδη γὰρ τὰ πρόσθεν τῆς τροπῆς γεγενημένης ἐτετάρακτο πάντα καὶ χαλεπὰ ἦν ὑπὸ τῆς βοῆς διαγνῶναι.

(*f*) πόλεσι γὰρ ταύταις μόναις ἤδη ὁμοιοτρόποις ἐπελθόντες, δημοκρατουμέναις τε, ὥσπερ καὶ αὐτοί, καὶ ναῦς καὶ ἵππους καὶ μεγέθη ἐχούσαις, οὐ δυνάμενοι ἐπενεγκεῖν οὔτε ἐκ πολιτείας τι μεταβολῆς τὸ διάφορον αὐτοῖς, ᾧ προσήγοντο ἄν, οὔτ' ἐκ παρασκευῆς πολλῷ κρείσσονος, σφαλλόμενοι δὲ τὰ πλείω, τά τε πρὸ αὐτῶν ἠπόρουν καὶ ἐπειδή γε καὶ ταῖς ναυσὶν ἐκρατήθησαν, ὃ οὐκ ἂν ᾤοντο, πολλῷ δὴ μᾶλλον ἔτι.

(*g*) Πρὸς οὖν ἀταξίαν τε τοιαύτην καὶ τύχην ἀνδρῶν ἑαυτὴν παραδεδωκυῖαν πολεμιωτάτων, ὀργῇ προσμείξωμεν, καὶ νομίσωμεν ἅμα μὲν νομιμώτατον εἶναι πρὸς τοὺς ἐναντίους, οἳ ἂν ὡς ἐπὶ τιμωρίᾳ τοῦ προσπεσόντος δικαιώσωσιν ἀποπλῆσαι τῆς γνώμης τὸ θυμούμενον, ἅμα δὲ ἐχθροὺς ἀμύνασθαι ἐκγενησόμενον ἡμῖν καί τὸ λεγόμενόν που ἥδιστον εἶναι.

(*h*) καὶ μὴν ἥ < τ' > ἄλλη αἰκία καὶ ἡ ἰσομοιρία τῶν κακῶν, ἔχουσά τινα ὅμως τὸ μετὰ πολλῶν κούφισιν, οὐδ' ὡς ῥᾳδία ἐν τῷ παρόντι ἐδοξάζετο, ἄλλως τε καὶ ἀπὸ οἵας λαμπρότητος καὶ αὐχήματος τοῦ πρώτου ἐς οἵαν τελευτὴν καὶ ταπεινότητα ἀφίκατο.

2. Annotate the following passages :—

(*a*) καὶ ξυνετείχισαν τὸ λοιπὸν τοῖς Συρακοσίοις μέχρι τοῦ ἐγκαρσίου τείχους.

(*b*) ναῦς τε οἱ Κορίνθιοι πέντε καὶ εἴκοσιν ἐπλήρουν, ὅπως ναυμαχίας τε ἀποπειράσωσι πρὸς τὴν ἐν τῇ Ναυπάκτῳ φυλακὴν, καὶ τὰς ὁλκάδας αὐτῶν ἧσσον οἱ ἐν τῇ Ναυπάκτῳ Ἀθηναῖοι κωλύοιεν ἀπαίρειν.

(*c*) ἔπειτα αὐτοὺς αἱ κεραῖαι ὑπὲρ τῶν ἔσπλων αἱ ἀπὸ τῶν ὁλκάδων δελφινοφόροι ἠρμέναι ἐκώλυον.

(*d*) τρίβειν οὖν ἔφη χρῆναι προσκαθημένους καὶ μὴ χρήμασιν, ὧν πολὺ κρείσσους εἰσί, κρατηθέντας ἀπιέναι.

(*e*) οὐδ' ἂν διαβουλεύσασθαι ἔτι ἔφη, πρίν, ὡς οἱ μάντεις ἐξηγοῦντο, τρὶς ἐννέα ἡμέρας μεῖναι, ὅπως ἂν πρότερον κινηθείη.

(*f*) εἰ μέν τινες ἴδοιεν πῃ τοὺς σφετέρους ἐπικρατοῦντας, ἀνεθάρσησαν ἄν.

3. Discuss the following Mss. readings :—

(*a*) ὅπως στρατία ἔτι περαιωθῇ τρόπῳ ᾧ ἂν ἐν ὁλκάσιν ἢ πλοίοις ἢ ἄλλως ὅπως ἂν προχωρῇ.

(*b*) καὶ χρήματα παλλὰ τὰ ξύμπαντα ἐάλω· ἄτε γὰρ ταμιείῳ χρωμένων τῶν Ἀθηναίων τοῖς τείχεσι πολλὰ... χρήματα... ἐνῆν. So B. other Mss. ὥστε.

(*c*) ἔκ τε τῶν ἀκάτων ὤνευον ἀναδούμενοι τοὺς σταυροὺς καὶ ἀνέκλων.

(*d*) ἀγγέλλων ὅτι αἱ... νῆες τῶν Κορινθίων... οὔτε καταλύουσι τὸν πόλεμον ναυμαχεῖν τε μέλλουσι.

(*e*) περιπλεῦσαι δὲ ἐς τὴν εὐρυχωρίαν, σφῶν ἐχόντων τὴν ἐπίπλευσιν ἀπὸ τοῦ πελάγους τε καὶ ἀνάκρουσιν, οὐ δυνήσεσθαι αὐτούς,

(*f*) ἔθνη γὰρ πλεῖστα δὴ ἐπὶ μίαν πόλιν ταύτην ξυνῆλθε, πλήν γε δὴ τοῦ ξύμπαντος λόγου τοῦ ἐν τῷδε τῷ πολέμῳ πρὸς τὴν Ἀθηναίων τε πόλιν καὶ Λακεδαιμονίων.

(*g*) ... ἐμάχοντο, Πλαταιῆς δὲ καταντικρὺ Βοιωτοὶ Βοιωτοῖς μόνοι εἰκότως κατ' ἔχθος.

4. Describe in detail the retreat of the Athenian forces.

CLASSICAL HONOURS.

GREEK PROSE COMPOSITION.

SATURDAY, APRIL 14TH:—2 TO 5 P.M.

France, without its sovereign, without money in her treasury, without an army, without generals to command it, and encompassed on all sides by a victorious and active enemy, seemed to be on the very brink of destruction. But on that occasion the great abilities of Louise the regent saved the kingdom which the violence of her passions had more than once exposed to the greatest danger. Instead of giving herself up to such lamentations as were natural to a woman so remarkable for her maternal tenderness, she discovered all the foresight and exerted all the activity of a consummate politician. She assembled the nobles at Lyons, and animated them by her example no less than by her words, with such zeal in defence of their country as its present situation required. She collected the remains of the army which had served in Italy, ransomed the prisoners, paid the arrears, and put them in a condition to take the field.

CLASSICAL HONOURS.

GREEK EPIC POETRY, HOMER OD. XIX–XXIII.

THURSDAY, APRIL 19TH :—MORNING, 9 TO 12.

1. Translate with notes :—

"ξεῖν', ἦ τοι μὲν ὄνειροι ἀμήχανοι ἀκριτόμυθοι
γίγνοντ', οὐδέ τι πάντα τελείεται ἀνθρώποισι.
δοιαὶ γάρ τε πύλαι ἀμενηνῶν εἰσὶν ὀνείρων·
αἱ μὲν γὰρ κεράεσσι τετεύχαται, αἱ δ' ἐλέφαντι·
τῶν οἳ μέν κ' ἔλθωσι διὰ πριστοῦ ἐλέφαντος,
οἵ ῥ' ἐλεφαίρονται, ἔπε' ἀκράαντα φέροντες·
οἱ δὲ διὰ ξεστῶν κεράων ἔλθωσι θύραζε,
οἵ ῥ' ἔτυμα κραίνουσι, βροτῶν ὅτε κέν τις ἴδηται."

2. Translate with notes :—

"ἀγρεῖθ', αἱ μὲν δῶμα κορήσατε ποιπνύσασαι,
ῥάσσατέ τ', ἔν τε θρόνοις εὐποιήτοισι τάπητας
βάλλετε πορφυρέους· αἱ δὲ σπόγγοισι τραπέζας
πάσας ἀμφιμάσασθε, καθήρατε δὲ κρητῆρας
καὶ δέπα ἀμφικύπελλα τετυγμένα· ταὶ δὲ μεθ' ὕδωρ
ἔρχεσθε κρήνηνδε, καὶ οἴσετε θᾶσσον ἰοῦσαι.
οὐ γὰρ δὴν μνηστῆρες ἀπέσσονται μεγάροιο
ἀλλὰ μάλ' ἦρι νέονται, ἐπεὶ καὶ πᾶσιν ἑορτή."

3. Translate with notes :—

ὡς εἰπὼν τόξον μὲν ἀπὸ ἕο θῆκε χαμᾶζε,
κλίνας κολλητῇσιν ἐυξέστῃς σανίδεσσιν,
αὐτοῦ δ' ὠκὺ βέλος καλῇ προσέκλινε κορώνῃ,
ἂψ δ' αὖτις κατ' ἄρ' ἕζετ' ἐπὶ θρόνου ἔνθεν ἀνέστη.
τοῖσιν δ' Ἀντίνοος μετέφη, Εὐπείθεος υἱός·
"ὄρνυσθ' ἐξείης ἐπιδέξια πάντες ἑταῖροι,
ἀρξάμενοι τοῦ χώρου ὅθεν τέ περ οἰνοχοεύει."
ὣς ἔφατ' Ἀντίνοος, τοῖσιν δ' ἐπιήνδανε μῦθος.

4. Translate with notes:—

ἀνδρῶν δ' ὄν κεν τις ζωὸς βροτὸς, οὐδὲ μάλ' ἡβῶν,
ῥεῖα μετοχλίσσειεν, ἐπεὶ μέγα σῆμα τέτυκται
ἐν λέχει ἀγκητῷ· τὸ δ' ἐγὼ κάμον οὐδέ τις ἄλλος.
θάμνος ἔφι τανύφυλλος ἐλαίης ἔρκεος ἐντὸς
ἀκμηνὸς θιλέθων· πάχετος δ' ἦν ἠύτε κίων.

5. Discuss the σκο/ε formations and their value, with examples from Greek, Latin and Sanskrit.

6 Write Etymological notes on :—

a. ἐν δαπέδῳ δὲ χαμαὶ βάλον ἀχνύμενον κῆρ.
b. δαΐφρων. c. σμερδαλέα. d. θείνω, ἔπεφνον.
e. αἰγίς. f. θυοσκόος. g. ὑπόδρα ἰδών.
h. σοὶ δ' ἄλοχόν τε φιλην σπέσθαι.

7. Comment on :—

i. ῥῶγες.
ii. οἵ τόδε ὠμα | ἐχράετ' ἐσθιέμεν καὶ πινέμεν ἐμμενὲς αἰεί.

8. Discuss the importance of Homeric Diction in the investigations of Comparative Linguistic, with a comment on the significance of the following:—

A. πρὸς ταῖτα συ λέξον Ὁμήρου ἐμοὶ γλώττας, τί καλοῦσι κόρυμβα; τί καλοῦσ' ἀμενηνὰ κάρηνα;

B. ὁ μὲν οὖν σός, ἐμὸς δ' οὗτος ἀδελφὸς φρασάτω, τί καλοῦσιν ἰδυίους; τί καλοῦσιν ἀποινᾶν;

Aristoph. Δαιταλεῖς.

9. Characterise briefly the contribution of Aristarchos to Homeric research.

10. *θεὸς δέ μοι ἐν φρεσὶν οἴμας | παντοίας ἐνέφυσεν* What are the *προοίμια* on Thucydides' authority?

11. Comment on the relation of Corinth to Epic Poetry.

12. Write notes on *ἀριμάσπεια ἔπη* — Parmenides — Empedokles — Apollonios Rhodios — *οἱ χωρίζοντες*.

B.A. HONOURS IN CLASSICS.

GREEK PHILOSOPHY AND CONSTITUTIONAL HISTORY.

MONDAY, 23RD APRIL:—9 TO 12 NOON.

The answers to A and B should be shown up in different books.

A.

1. Describe the main characteristics of the pre-Socratic philosophy, adding a brief note on each of the following: *Anaxagoras, Democritus, Thales, Heraclitus, Empedocles.*

2. Give a brief account of the more prominent Sophists who were predecessors or contemporaries of Plato.

3. Show the interconnection between the ethical and the political questions of the *Republic.*

4. Briefly state Plato's theory of education. What are his objections to Homer, and how far does he intend them seriously?

5. Give a short account of the tenets of the various schools of philosophy which succeeded Socrates.

6. "Aristotle codified Plato." Explain this statement, and give a short summary of the nature of Aristotle's contributions to philosophy and science.

B.

1. Into what periods may the Constitutional History of Greece be divided? Distinguish the leading characteristics of each and give actual instances of transition from one form of government to another.

2. Describe the various elements which went to make up the Spartan community and contrast the constitution of Sparta with those of the Cretan cities.

3. What is the evidence which goes to show that the population of Attica was made up of elements from various sources? Discuss the problems connected with (*a*) the Ionic tribes, (*b*) the institution of the archonship, (*c*) the financial reforms of Solon.

4. Discuss the Athenian system of election by lot. When was it first instituted, when dropped, and when revived? Consider its main advantages and disadvantages and the arrangements in Athens for minimizing its dangers.

5. Examine briefly (*a*) the connection between forms of government and the circumstances, internal and external, under which they are adopted or retained; (*b*) the advisability of payment for participation in the legislative or judicial duties of a citizen.

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LATIN.

FIRST YEAR SESSIONAL EXAMINATION.

WEDNESDAY, APRIL 4TH :—MORNING, 9 TO 12.

OVID, *Tristia I:* CICERO: *Pro Roscio Amerino*. VIRGIL, *Aeneid IV.*

I. OVID.

1. Translate :—

(*a*) Si quis, ut in populo, nostri non immemor illi,
s. quis, qui, quid agam, forte requiret, erit :
vivere me dices, salvum tamen esse negabis :
id quoque, quod vivam, munus habere dei.

Account for the subjunctives 'agam,' and 'vivam.'

(*b*) Ingeniique minor laude ferere mei.

(*c*) Nec tamen, ut cuncti miserum servare velitis,
quod periit, salvum iam caput esse potest.

(*d*) Multaque credibili tulimus maiora ratamque,
quamvis acciderint, non habitura fidem.

(*e*) Utque cremasse suum fertur sub stipite natum
Thestias et melior matre fuisse soror,
Sic ego non meritos mecum peritura libellos
imposui rapidis viscera nostra rogis :
vel quod eram musas. ut crimina nostra, perosus,
vel quod adhuc crescens et rude carmen erat.

What is the 'carmen' alluded to?

(*f*) Mobile sic sequitur fortunae lumina vulgus,
quae simul inducta nocte teguntur, abit.

2. Write a brief note on Thestias, custos Atlandidos ursae, Miletis urbs, Symplegades, Cyzicos, Cenchreae, Laodamia, Caphereus.

3. Scan the first two lines of 1 (*e*) and give—with exceptions—the quantity of the following in final syllables, *as, us, at, a, e.*

II. CICERO.

Translate with notes, especially on the words *in italics* :—

1. Cum nulla iam proscriptionis mentio fieret, cum etiam qui antea metuerant redirent ac iam defunctos esse periculis arbitrarentur, nomen *refertur in tabulas* Sex. Roscii, hominis studiosissimi nobilitatis ; *manceps* fit Chrysogonus.

2. hoc vero est quod ferri non potest, si et in hanc calamitatem venit propter praediorum bonitatem et multitudinem, et, quod ea studiose coluit, id erit ei maxime fraudi, ut parum miseriae sit quod aliis coluit, non sibi, nisi etiam quod omnino coluit crimini fuerit.

3. portentum atque monstrum certissimum est esse aliquem humana *specie* et figura, qui tantum immanitate bestias *vicerit* ut propter quos hanc suavissimam lucem *aspexerit*, eos indignissime *luce* privarit.

4. quae ita aperta et manifesta sunt ut *me dius fidius*, iudices, invitus ea dicam ; vereor enim, *cuicuimodi* es, T. Rosci, ne ita hunc videar voluisse servare ut tibi omnino non pepercerim.

5. Ego haec a Chrysogono,mea sponte, remoto Sex. Roscio quæro : primum qua re civis optimi bona *venierint*, deinde qua re hominis eius qui neque proscriptus neque apud adversarios *occisus est*, cum in eos solos lex *scripta sit*, deinde qua re aliquanto post eam diem venierint, quae dies in lege praefinita est, deinde cur *tantulo* venierint : quae omnia si, quem ad modum solent liberti nequam et improbi facere, in patronum suum voluerit conferre, nihil *egerit*.

III. VIRGIL.

1. Translate :

> It clamor totis per propugnacula muris :
> Intendunt acres arcus, amentaque torquent
> Sternitur omne solum telis ; tum scuta cavaeque
> Dant sonitum flictu galeae ; pugna aspera surgit :
> Quantus ab occasu veniens pluvialibus Haedis
> Verberat imber humum : quam multa grandine nimbi
> In vada praecipitant, cum Iupiter horridus Austris
> Torquet aquosam hiemem, et caelo cava nubila rumpit.

2. Translate, and write brief explanatory notes on words or phrases in italics :

> (*a*) Ipsa *deum* fertur genetrix *Berecyntia* magnum
> vocibus his adfata Iovem : 'da, nate, petenti,
> quod tua cara parens *domito* te poscit *Olympo*.
> (*b*) *venatu* invigilant pueri silvasque fatigant ;
> *flectere* ludus equos et spicula tendere cornu.

(*c*) Ceu saevum turba leonem
cum telis premit infensis ; at territus ille
asper, *acerba* tuens, retro redit, et neque terga
ira dare aut virtus patitur, nec tendere contra
(ille quidem hoc cupiens) *potis est* per tela virosque.
haud aliter retro dubius vestigia Turnus
inproperata refert, et mens exaestuat ira.

3. Scan the first three lines of the last passage.

FIRST YEAR SESSIONAL EXAMINATION.

ROMAN HISTORY—THE PUNIC WARS.

WEDNESDAY, APRIL 4TH :—AFTERNOON, 2 TO 3.

Write upon any four of the following topics.

1. Rome and Carthage compared.

2. Regulus and the Carthaginian embassy.

3. Battles of the Ticinus, the Trebia, and of Lake Trasimenus (with dates).

4. A brief description of the Third Punic War.

5. Give the geographical position of Cannae, Panormus, Messana, New Carthage, Agrigentum. Also important events connected with these places and the dates of such events.

FIRST YEAR SESSIONAL EXAMINATION.

LATIN COMPOSITION AND UNSEEN.

WEDNESDAY, APRIL 4TH :—AFTERNOON, 3 TO 5.30.

Translate :—

(*a*) He said that the camp would be fortified.

(*b*) He told us that we might go.

(*c*) The king had been persuaded to wage war.

(*d*) Do not envy the soldiers who are going away to besiege Rome.

(*e*) When he had lived at Ephesus for five years he returned to Puteoli.

(*f*) He esteems me more highly than his brother.

(*g*) How much did you give for that horse ?

(*h*) The army of the Romans had been defeated so often that the consuls despaired of the republic.

(*i*) If one may employ great examples in small (things) such was the appearance of Troy, when it was captured.

(*k*) Caesar having arrived in Rome the citizens fled, thinking that he would destroy the city.

FOR UNSEEN.

A. Quantum inter philosophiam interest, Lucili virorum optime, et ceteras artes, tantum interesse existimo in ipsa philosophia inter illam partem, quae ad homines, et hanc quae ad deos pertinet. Altior est haec et animosior. Multum permisit sibi : non fuit oculis contenta. Maius esse quiddam suspicata est ac pulcrius, quod extra conspectum natura posuisset. Denique tantum inter duas interest, quantum inter deum et hominem. Altera docet, quid in terris agendum sit, altera, quid agatur in caelo. Altera errores nostros discutit et lumen admovet, quo discernantur ambigua vitae : altera multo supra hanc, in qua volutamur, caliginem excedit et e tenebris ereptos perducit illo, unde lucet.

interest = 'there is a difference.'

B. Paeninsularum, Sirmio, insularumque
ocelle, quascunque in liquentibus stagnis
marique vasto fert uterque Neptunus,
quam te libenter quamque laetus inviso,
vix mi ipse credens Thyniam atque Bithynos
liquisse campos et videre te in tuto.
O quid solutis est beatius curis,
cum mens onus reponit, ac peregrino
labore fessi venimus larem ad nostrum
desideratoque acquiescimus lecto.

ocellus, translate 'gem.'

INTERMEDIATE EXAMINATION.

LATIN.

WEDNESDAY, APRIL 4TH :—MORNING, 9 TO 12.

Write A, B and C in separate books.

A.—LIVY.

1. Translate :—

(*a*) Et postquam icto Romae cum Samnitibus foedere fetiales venerant res repetitum, temptationem aiebant esse, ut terrore incusso belli Romanos se fieri paterentur, quod quanto opere optandum foret Hernicos docuisse, cum quibus licuerit suas leges Romanae civitati praeoptaverint.

(*b*) In quas nec iussu consulum nec signo accepto victores vadunt, malo tirocinio imbuendum Samnitem clamitantes.

(*c*) Paenitet enim, quod antiquissimum sollemne et solum ab ipso, cui fit, institutum deo, ab nobilissimis antistitibus eius sacri ad servorum ministerium religiosus censor deduxisti, gens antiquior originibus urbis huius, hospitio deorum immortalium sancta, propter te ac tuam censuram intra annum ab stirpe extincta est, nisi universam rempublicam eo nefario obstrinxeris, quod ominari etiam reformidat animus.

(*d*) Ne ille saepe, etiam si prima prospere evenissent, Persas et Indos et inbellem Asiam quaesisset, et cum feminis sibi bellum fuisse dixisset, quod Epiri regem Alexandrum mortifero vulnere ictum dixisse ferunt, sortem bellorum in Asia gestorum ab hoc ipso iuvene cum sua conferentem.

(*e*) Per utros stetisset quo minus discederetur ab armis, adversus eos se pro alteris pugnaturos. Who is it that makes this threat?

(*f*) Quid tandem? si spopondissemus urbem hanc relicturum populum Romanum, si incensurum, si magistratus, si senatum, si leges non habiturum, si sub regibus futurum. di meliora, inquis. atqui non indignitas rerum sponsionis vinculum levat.

B.—HORACE. Historical and Political Odes

1. Translate and comment on words in *italics*:

(*a*) Libentur hoc et omne militabitur
bellum in tuae spem gratiae,
non ut iuvencis inligata pluribus
aratra nitantur meis
pecusne *Calabris* ante sidus pervidum
Lucana mutet *pascuis*,
neque ut *superni* villa candens *Tusculi*
Circaea tangat moenia.

(*b*) Caelo tonantem credidimus Iovem
regnare: praesens divus habebitur
Augustus *adiectis Britannis*
imperio *gravibusque Persis*.

(*c*) Romulum post hos prius, an quietum
Pompili regnum memorem, an superbos
Tarquini fasces, dubito, an *Catonis*
nobile letum.

(*d*) Multa *Dircaeum* levat aura *cycnum*,
tendit, *Antoni*, quoties in altos
nubium tractus.

2. Give a brief outline of any two of the odes from which the above extracts are taken.

3. Name and describe any two of the metres represented in these extracts.

C. QUINTILIAN.

Translate with comments :—

1. Hunc nemo in magnis rebus sublimitate, in parvis proprietate superaverit. Idem laetus ac pressus, iucundus et gravis, tum copia tum brevitate mirabilis, nec poetica modo sed oratoria virtute eminentissimus. Nam ut de laudibus, exhortationibus, consolationibus taceam : nonne vel nonus liber quo missa ad Achillem legatio continetur, vel in primo inter duces illa contentio vel dictae in secundo sententiae omnes litium ac consiliorum explicant artes

2. Sed dum assequimur illam firmam, ut dixi, facilitatem, optimis assuescendum est et multa magis quam multorum lectione formanda mens et ducendus color.

3. How does Quintilian contrast Roman with Attic comedy ?

4. Quid tamen his ipsis eius operibus, in quae donato imperio iuvenis secesserat, sublimius, doctius, omnibus denique numeris praestantius ?

5. Iambus non sane a Romanis celebratus est ut proprium opus, sed aliis quibusdam interpositus; cuius acerbitas in Catullo Bibaculo Horatio, quamquam illi epodos intervenit, reperietur.

6. Non enim "pluvias" ut ait Pindarus, "aquas colligit sed vivo gurgite exundat," dono quodam providentiae genitus, in quo totas vires suas eloquentia experiretur.

INTERMEDIATE EXAMINATION.

ROMAN HISTORY AND LITERATURE.

WEDNESDAY, APRIL 4TH :—AFTERNOON, 2 TO 3 P.M.

I. and II. to be written in separate books.

Not more than six questions to be answered—three from each division of the paper.

I.

1. Describe the Agrarian Laws of Tiberius Gracchus.

2. Give an account of the war with Jugurtha.

3. Give the date and leading provisions of the Livian Laws, the Julian Law, and the Lex Plautia Papiria.

4. Sketch the last days of the Republic—44-31 B.C.

II.

1. Into what periods may the history of Latin Literature be conveniently divided?

2. Compare and contrast Lucretius and Catullus.

3. The personal characteristics of Horace.

4. Virgil's motive and main purpose in the composition of the Æneid.

INTERMEDIATE EXAMINATION.

LATIN PROSE COMPOSITION AND TRANSLATION AT SIGHT.

WEDNESDAY, APRIL 4TH:—AFTERNOON, 3 TO 5.30.

I.

When Hannibal, after taking the city, saw that the Carthaginians were so taken up with slaughter that no one could fairly hear what he directed for the noise, he called the commanders of the young men together and ordered[1] them to bid their troops keep quiet and spare the Tarentines; [2]the Carthaginians must not slay, must not plunder; for the hearts of townspeople are not won by the taking of their cities. "If you will keep quiet," said he, "Fabius, who I know is not far from Tarentum will set the Romans in motion to seize the city by forced marches."

[1] Use *impero*. [2] Render all that follows into indirect discourse.

II.

PENELOPE ULIXI.

1. Translate:—

Ausus es o nimium nimiumque oblite tuorum,
Thracia nocturno tangere castra dolo,
Totque simul mactare viros, adiutus ab uno!
At bene cautus eras et memor ante mei?
Sed mihi quid prodest vestris disiecta lacertis
Ilios, et murus quod fuit esse solum,
Si maneo qualis Troia durante manebam,
Virque mihi dempto fine carendus abest?
Diruta sunt aliis, uni mihi Pergama restant,
Incola captivo quae bove victor arat.

2. Videtisne igitur, ut a physicis rebus bene atque utiliter inventis tracta ratio sit ad commenticios et fictos deos? quæ res genuit falsas opiniones erroresque turbulentos et superstitiones paene aniles. Et formæ enim nobis deorum et aetates et vestitus ornatusque noti sunt, genera praeterea, coniugia, cognationes omniaque traducta ad similitudinem inbecillitatis humanae; nam et perturbatis animis inducuntur; accepimus enim deorum cupiditates, aegritudines, iracundias; nec vero ut fabulae ferunt, bellis proeliisque caruerunt, nec solum, ut apud Homerum, cum duo exercitus contrarios alii dei ex alia parte defenderent, sed etiam, ut cum Titanis, ut cum Gigantibus, sua propria bella gesserunt. Haec et dicuntur et creduntur stultissime et plena sunt futtilitatis summæque levitatis.

THIRD YEAR SESSIONAL EXAMINATION.

LATIN.

WEDNESDAY, APRIL 4TH:—MORNING. 9 TO 12.

I.—TACITUS.

N. B.—Regard will be paid to style in translation.

1. Translate:—

(*a*) Tum, ut quisque praecipuus turbator conquisiti; et pars extra castra palantes a centurionibus aut *praetoriarum cohortium militibus* caesi, quosdam ipsi manipuli, documentum fidei, tradidere. Auxerat militum curas praematura hiems, imbribus continuis adeoque saevis, ut non *egredi tentoria*, congregari inter se, vix tutari signa possent, quae turbine atque unda raptabantur. Durabat et formido caelestis irae nec frustra adversus impios hebescere sidera, ruere tempestates: non aliud malorum levamentum quam si *linquerent* castra infausta temerataque et soluti piaculo suis quisque hibernis redderentur. Primum octava, dein quinta decuma legio rediere: nonanus opperiendas Tiberii epistulas clamitaverat, mox desolatus aliorum discessione imminentem necessitatem sponte praevenit. Et Drusus non expectato legatorum regressu, quia praesentia satis consederant in urbem rediit.

(*b*) Id Tiberii animum altius penetravit. Non enim simplices eas curas, nec adversus externos militem quaeri. Nihil relictum imperatoribus, ubi femina manipulos intervisat, signa adeat, largitionem temptet, tanquam parum ambitiose filium ducis gregali habitu circumferat Cæsaremque Caligulam appellari velit.

(*c*) Mulcant sexageni singulos ut numerum centurionum adaequarent.

2. Write a brief note on the words underlined and on *centesima rerum venalium*, *erogare pecuniam*, *dira quies*, *addito acutiorem esse*, *vernacula multitudo*, *cedo alteram*, *occisus dictator Cæsar*.

3. Write a line to say what mention is made of each of the following in this book:—Cassius Chaerea, Seianus, C. Plinius, Pansa, [illegible] n Pandateria, L. Domitius, M. Lepidus, Romanus Hispo, L. Caesar.

II. PLAUTUS, TRINUMMUS.

1. Translate:—

(*a*)
Primumdum omnium
Male dictitatur tibi volgo in sermonibus.
Turpilucricupidum te vocant cives tui:
Tum autem sunt alii qui te volturium vocant:
Hostisne an civis comedis parvi pendere.
Haec quom audio in te dici, is excrucior miser.

Explain the forms *comedis* and *is*.

(*b*)
ST. Audi cetera.
Postid, frumenti quom alibi messis maxumast,
Tribus tantis illi minus redit quam obseveris.
PH. Em istic oportet opseri mores malos,
Si in opserendo possint interfieri.

Remark on the form or construction of *postid*, *tribus tantis*, *opseri*, *si—possint*, *interfieri*.

(*c*) Salsipotenti et multipotenti Iovis fratri aetheriai Neptuno
Laetus lubens laudes ago et grates gratiasque
habes et fluctibus salsis,
Quos penes mei fuit summa potestas, bonis
meis quid foret et meae vitae,
Quom suis me ex locis in patriam urbem sic
columen reducem faciunt.

Who is the speaker, and how is he dressed? What is the connection of this passage with the context?
Name the metre, and scan the first line.
Point out some distinctive features of this and similar *cantica*.

(*d*) CH. Spondeo et mille *auri Philippum dotis* LY.
Dotem mil moror.
CH. Si illa tibi placet, placenda dos quoquest quam dat tibi.
Postremo *quod vis* non duces, nisi illud quod non vis feres.
C.A. Ius hic *orat*.

Write explanatory notes on words printed in italics.

III. OVID, FASTI, Bk. VI.

Translate, with explanatory remarks:

(*a*) Hic ego quaerebam, coepti quae mensis origo
Esset, et in cura nominis huius eram.
Ecce deas vidi: non quas praeceptor arandi
Viderat, Ascraeas cum sequeretur oves:
Nec quas Priamides in aquosae vallibus Idae
Contulit.

(*b*) Dena quater memorant habuisse Parilia Romam
Cum flammae custos aede recepta sua est:
Regis opus placidi, quo non metuentius ullum
Numinis ingenium terra Sabina tulit.

(*c*) Hanc tibi, 'Quo properas?' memorant dixisse, Rutili?
'Luce mea Marso consul ab hoste cades.'
Exitus accessit verbis, flumenque Toleni
Purpureum mixtis sanguine fluxit aquis.
Proximus annus erat: Pallantide caesus eadem
Didius hostiles ingeminavit opes.

2. Write brief notes on: *flamen Dialis*, *Ops*, *maenadas Ausonias*, *Dictynna*, *Lacus Curtius*.

THIRD YEAR SESSIONAL EXAMINATION.

ROMAN HISTORY AND LITERATURE.

Wednesday, April 4th:—Afternoon, 2 to 3.

Write A and B in separate Books.

A.

1. Give the geographical location (by map or otherwise) of the following places or peoples: Caere, Gabii, Iapygia, Alba Longa, Tarquinii.

2. Give leading events under the following dates: B.C. 715, 509, 494, 445, 451.

3. Describe the early government of Rome; the functions of the King, the Senate, and Comitia Curiata.

4. Name and briefly describe the Laws carried to alleviate the condition of the poor.

B.

1. Indicate briefly any characteristics of Roman literature.

2. Write one or two lines on the following authors :—Ennius, Lucilius, Varro, Tibullus, Persius, Suetonius, Martial, Claudian, Boethius.

3. Enumerate either

(*a*) the plays of Terence,

or (*b*) the speeches of Cicero,

or (*c*) the subjects of the first six books of the Aeneid.

N.B. Only one of these three to be attempted.

THIRD YEAR SESSIONAL EXAMINATION.

LATIN COMPOSITION AND UNSEEN.

WEDNESDAY, APRIL 4TH :—AFTERNOON, 3 TO 5.30.

FOR PROSE.

It was impossible to let the Empire devolve immediately upon his son Lucius, who was only a child of seven years. Accordingly Hadrian chose T. Aurelius Fulvus Boionius Antoninus, a man of consular rank, who had reached his fifty-second year, and seemed in every way a safe choice Hadrian on January 24th, his own birthday, notified his intention to the senate and recommended Antoninus. When, after a month's consideration, Antoninus consented to accept the honour which was proposed, he was duly adopted, and was at once raised to a higher position than Verus had occupied, receiving the proconsular imperium, with the title Imperator and the tribunician power. He was thus a consort in the full sense, and all that still failed him was the title Augustus and probably the special privileges conferred by the lex de imperio.

FOR UNSEEN TRANSLATION.

1. A Letter of Recommendation.

Democritus Sicyonius non solum hospes meus est, sed etiam, quod non multis contingit, Graecis praesertim, valde familiaris. Est enim in eo summa probitas, summa virtus, summa in hospites liberalitas et observantia : meque praeter ceteros et colit et observat et diligit. Eum tu non modo suorum civium, verum paene Achaiae principem cognosces. Huic ego tantummodo aditum ad tuam cognitionem patefacio et munio : cognitum per te ipsum, quae tua natura est, dignum tua amicitia atque hospitio iudicabis. Peto igitur a te, ut his litteris lectis recipias eum in tuam fidem, polliceare omnia te facturum mea causa De reliquo, si, id quod

confido, fore dignum eum tua amicitia hospitioque cognoveris, petuo, eum complectare, diligas, in tuis habeas. Erit id mihi maiorem in modum gratum. Vale.

2. Hercules in Quest of Hylas.

Ille, velut refugi quem contigit improba Mauri
lancea sanguineus vasto leo murmure fertur,
frangit et absentem vacuis sub dentibus hostem,
sic furiis accensa gerens Tirynthius ora
fertur et intento discurrit montibus arcu;
heu miserae quibus ille ferae, quibus incidit usquam
immeritis per lustra viri: volat ordine nullo
cuncta petens; nunc ad ripas deiectaque saxis
flumina, nunc notas memorum procurrit ad umbras.

B.A. ORDINARY.

LATIN.

CICERO, *Philippics V* and *VII*; TACITUS, *Histories II*; LUCRETIUS I.-III. (*Selections*).

WEDNESDAY, APRIL 4TH:—MORNING, 9 TO 12.

I.

1. Translate, with explanatory notes:

(*a*) Agitur, utrum M. Antonio facultas detur opprimendae rei publicae et caedis faciendae bonorum, urbis dividundae, agrorum suis latronibus condonandi, populum Romanum servitute opprimendi, an horum ei facere nihil liceat.

(*b*) Et erat insula amne medio, in quam gladiatores navibus molientes Germani nando praelabebantur. Ac forte plures transgressos completis Liburnicis per promptissimos gladiatorum Macer adgreditur, sed neque ea constantia gladiatoribus ad proelia militibus, nec perinde nutantes e navibus quam stabili gradu e ripa volnera derigebant. Et cum variis trepidantium inclinationibus mixti remiges propugnatoresque turbarentur, desilire in vada ultro Germani, retentare puppes, scandere foros aut comminus mergere. Quae cuncta in oculis utriusque exercitus quanto laetiora Vitellianis, tanto acrius Othoniani causam auctoremque cladis detestabantur.

(*c*) O miseras hominum mentes, o pectora caeca!
qualibus in tenebris vitae quantisque periclis
degitur hoc aevi quod cumquest! nonne videre
nil aliud sibi naturam latrare, nisi ut, cui
corpore seiunctus dolor absit, menti' fruatur
iucundo sensu, cura semotu' metuque?

2. Translate, with brief notes on words in italics :

(*a*) Parvis de rebus, sed fortasse necessariis consulimur, patres conscripti. De Appia via et de *Moneta* consul, de *Lupercis* tribunus pl. refert. Quarum rerum etsi facilis explicatio videtur, tamen animus aberrat a sententia suspensus curis maioribus.

When were these words spoken, and how are they related to the context?

(*b*) His pavoribus nutantem et alii legati amicique firmabant et Mucianus post multos *secretosque* sermones iam et *coram* ita locutus : " omnes, qui magnarum rerum consilia suscipiunt, aestimare debent, an quod incohaturi rei publicae utile, ipsis gloriosum, an promptum effectu aut certe non arduum sit.

What other reading is found for *quod incohaturi—an*, and how would the sense be affected ?

(*c*) Ipse Vitellius a *ponte Mulvio* insigni equo, *paludatus*, senatum et populum ante se agens, quo minus ut captam urbem ingrederetur, amicorum consilio deterritus, *sumpta praetexta* et composito agmine incessit. Quattuor legionum aquilae ; dein quattuor et triginta cohortes, ut nomina gentium aut species armorum *forent*, discretae. Ante aquilas *praefecti castrorum tribunique* et *primi centurionum* candida veste.

(*d*) Haud dubia destinatione discessere, Mucianus *Antiochiam*, Neposianus Caesaream, *illa* Suriae, *hoc* Iudaeae caput est.

Initium ferendi ad Vespasianum imperii Alexandriae *coeptum*, festinante Tiberio, Alexandro, qui Kalendis Iuliis sacramento eius legiones adegit. Isque primus principatus dies in posterum celebratus, quamvis Iudaicus exercitus quinto nonas Iulias apud ipum iurasset, eo ardore, ut ne Titus quidem filius expectaretur, *Suria* remeans at consiliorum inter Mucianum ac patrem nuntius.

(*e*) Hic tamen et supra quos diximus inferiores
partibus egregie multis multoque minores,
quamquam multa bene ac divinitus invenien es
ex adyto tam quam cordis responsa dedere
sanctius et multo certa ratione magis quam
Pythia quae *tripodi* a Phoebi *lauroque profatur*
principiis tamen in rerum fecere ruinas
et graviter magni magno cecidere ibi casu.

Hic .....quos diximus inferiores : to whom is the poet referring?

B.A. ORDINARY.

ROMAN HISTORY.

WEDNESDAY, APRIL 4TH:—AFTERNOON, 2 TO 3.

N.B.—Not more than 6 questions to be attempted.

1. Trace the steps by which Augustus constructed the imperial power.

2. A genealogical tree of the family of Augustus.

3. A short account of events between the death of Nero and accession of Vespasian.

4. The army in the first century of the Empire.

5. The condition of the provinces in the first century of the Empire.

6. Distinguish senatorial from imperial provinces, and name some of each.

7. Alterations in the election to magistracies.

8. Reforms in the functions of the Senate.

B.A. ORDINARY.

LATIN PROSE COMPOSITION AND TRANSLATION AT SIGHT.

WEDNESDAY, APRIL 4TH:—3 TO 5.30 P.M.

I.

Nor did Civilis marshal his army in silence. He told the Germans and Batavians that they were standing on the monuments of their glory, that they were treading under foot the ashes and bones of legions. "Wherever," he said, "the Roman turns his eyes, captivity, disaster, and everything that is terrible, confront him. Do not be alarmed by the adverse result of the battle among the Treviri. There, their own success proved hurtful to the Germans, for, throwing away their arms, they hampered their hands with plunder. Since then everything has been favourable to us, and against the foe. All precautions, which the skill of a general should take, have been taken. This day will either be the most glorious among the deeds of the past, or will be infamous in the yes posterity."

II.

Ubi sono armorum (ita illis mos) adprobata sunt dicta, saxis glandibusque et ceteris missilibus proelium incipitur, neque nostro milite paludem ingrediente et Germanis, ut elicerent, lacessentibus. Absumptis quae iaciuntur et ardescente pugna procursum ab hoste infestius: immensis corporibus et praelongis hastis fluitantem labantemque militem eminus fodiebant: simul e mole, quam eductam in Rhenum rettulimus, Bructerorum cuneus tranavit. Turbata ibi res et pellebatur sociarum cohortium acies, cum legiones pugnam excipiunt suppressaque hostium ferocia proelium aequatur. Inter quae perfuga Batavus adiit Cerialem, terga hostium promittens, si extremo paludis eques mitteretur. Duae alae cum perfuga missae incauto hosti circumfunduntur. Quod ubi clamore cognitum, legiones a fronte incubuere, pulsique Germani Rhenun fuga petebant.

III.

LAUS ROMAE.

Haec est in gremium victos quae sola recepit
humanumque genus communi nomine fouit
matris, non dominae ritu: ciuesque uocauit
quos domuit, nexuque pio longinqua reuinxit.
Huius pacificis debemus moribus omnes
quod veluti patriis regionibus utitur hospes:
quod sedem mutare licet: quod cernere Thulen
lusus, et horrendos quondam penetrare recessus:
quod bibimus passim Rhodanum, potamus Oronten
quod cuncti gens una sumus. nec terminus unquam
Romanae dicionis erat, nam cetera regna
luxuries uitiis odiisque superbia uertit.

THIRD YEAR CLASSICAL HONOURS.

LATIN.

1½ HOURS.

HORACE, *Epistles I.* VIRGIL, *Aeneid V.* SALLUST, *Catiline.*

1. Translate, with brief comments:

(*a*) Est quadam prodire tenus, si non datur ultra,
Fervet avaritia miseroque cupidine pectus:
sunt verba et voces quibus hunc lenire dolorem
po[illegible]nam morbi dcpcrdic partem.

(*b*) Fabula, qua Paridis propter narratur amorem
Graecia barbaria lento collisa duello,
stultorum regum et populorum continet aestus.
Antenor censet belli praecidere causam.
Quid Paris? Ut salvus regnet vivatque beatus,
cogi posse negat.

2. Without translating, write explanatory notes on the words in italics.

a Non tu corpus *eras* sine pectore: di tibi,
Di tibi divitias *dederunt* artemque fruendi.

(*b*) *Caerite cera* digni.

(*c*) *Rure* ego viventem, tu dicis in urbe beatum.

(*d*) Neve putes alium *sapiente bonoque* beatum.

(*e*) Fautor *utroque* tuum laudabit *pollice* ludum.

3. Translate, writing a note on some *one* point in each passage:

(*a*) Ipse gubernator puppi Palinurus ab alta:
"Heu! quianam tanti cinxerunt aetheria nimbi?
Quidue, pater Neptune, paras?" Sic deinde locutus,
colligere arma iubet validisque incumbere remis,
obliquatque sinus in ventum.

(*b*) Ille sub haec: "Non laudis amor, nec gloria cessit
pulsa metu; sed enim gelidus tardante senecta
sanguis hebet, frigentque effectae in corpore vires.
Si mihi, quae quondam fuerat, quaque improbus iste
exultat fidens, si nunc foret illa iuventas,
haud equidem pretio inductus pulchroque iuvenco
venissem, nec dona moror"

To whom does *Ille* refer?

(*c*) Una omnes fecere pedem, pariterque sinistros,
nunc dextros solvere sinus; una ardua torquent
cornua detorqentque; ferunt sua flamina classem.
Princeps ante omnes densum Palinurus agebat
agmen; ad hunc alii cursum contendere iussi.

4. Translate, with notes on words italicised:

(*a*) Postquam, ut dixi, senatus in Catonis sententiam discessit, consul, optumum factu ratus noctem quae instabat antecapere, ne quid eo spatio novaretur, *tresviros* quae ad supplicium postulabat parare iubet: ipse praesidiis dispositis, Lentulum *in carcerem* deducit; idem fit ceteris per praetores. Est in carcere locus quod *Tullianum* appellatur, ubi paululum ascenderis ad laevam, circiter duodecim pedes humi depressus. Eum muniunt undique parietes atque insuper camera lapideis [illegible]icibus iuncta, sed incultu, tenebris, odore, foeda atque terribilis eius faeies est.

(*b*) Igitur *senati* decreto Marcus Rex *Faesulas* Metellus Creticus in Apuliam *circumque ea* loca missi — ei utrique *ad urbem imperatores* erant, impediti ne triumpharent calumnia paucorum, quibus omnia honesta asque inhonesta vendere mos erat.

THIRD YEAR CLASSICAL HONOURS.

LATIN.

CICERO PRO PLANCIO AND SELECTED LETTERS.

1. Translate :—

(*a*) Nam si ita esset, quod patres apud maiores nostros tenere non potuerunt, ut reprehensores essent comitiorum, id haberent iudices, vel quod multo etiam minus esset ferendum.

(*b*) Ut fueris dignior quam Plancius — de quo ipso ita contendam paulo post, ut conservem dignitatem tuam — sed ut fueris dignior, non competitor, a quo es victus, sed populus, a quo es praeteritus, in culpa est.

(*c*) Quis est nostrum liberaliter educatus, cui non educatores, cui non magister sui atque doctores, cui non locus ipse mutus ille, ubi alitus aut doctus est, cum grata recordatione in mente versetur ?

(*d*) Si locus habet reprehensionis ansam aliquam, nescio cur severiorem Nicaeam putes quam Rhodum.

2. What mention is made of the following in the *Pro Plancio* ?

(*a*) Consules post hominum taeterrimi et turpissimi : Who were they and what else is said of them ? (*b*) Tusculum, (*c*) Vaccaei, (*d*) Atina, *e*) C Vergilius, (*f*) praetor Macedoniae ; who was he ? (*g*) Opimius, (*h*) Metellus, (*i*) Cato Major, (*k*) Tegernseensis codex, (*l*) Syracuse. Explain medius fidius, editicii judices, tensae.

3. Translate :—

(*a*) Prensat unus P. Galba : Sine fuco ac fallaciis more maiorum negatur.

(*b*) Is, quem putabant magistrum fore, si bona venirent.

(*c*) Mercuri mallem aliquod fuisset : felicius, puto, cum Avianio transigere possemus. Explain.

(*d*) Ista quidem summa ne ego multo libentius emerim deversorium Tarracinae, ne semper hospiti molestus sim.

(*e*) Respondebo tibi *ὑστερον πρότερον Ὁμηρικῶς*. Explain.

(*f*) Regem appellas, cum Rex tui mentionem nullam fecerit ?

(*g*) Quod de domo scribis, hoc est de area, ego vero tum denique mihi videbor restitutus, si illa nobis erit restituta.

(*h*) Itaque te plane etiam atque etiam rogo ut et ornes ea vehementius etiam quam fortasse sentis. To whom is Cicero writing and about what?

(*i*) Stabianum perforasti. Add a note.

(*k*) Multis luminibus ingeni, multae tamen artis. Of whom is he speaking? What other reading is there?

(*l*) At Domitius, cum manus ad os apposuit.

4. A note on accuderint, fratres nostri Aedui, cum exercitu lustrato, non vici instar, post Leuctricam pugnam, Piso noster, Deiotarus, Trebatius, Pomponia, Empedoclea, Tiro, Eupolis, Aesopus, Metellus Pius Scipio.

5. Who were consuls in 59, 58, 57 B.C.? Write two or three lines on Cicero's position during those years.

CLASSICAL HONOURS.

LATIN.

CICERO, *Tusculans, III*; QUINTILIAN X; TACITUS, *Annals III.*

TUESDAY, APRIL 3RD:—MORNING, 9 TO 12.

CICERO.

1. Translate:—

(*a*) Nec vero de hoc quisquam dubitare posset, nisi idem nobis accideret diligenter de animo cogitantibus, quod iis saepe usu venit, qui acriter oculis deficientem solem intuerentur, ut aspectum omnino amitterent; sic mentis acies se ipsa intuens nonnunquam hebescit, ob eamque causam contemplandi diligentiam amittimus. Itaque dubitans, circumspectans, haesitans, multa adversa reverens tamquam in rate in mari immenso nostra vehitur ratio.

(*b*) Sed is quasi dictata, nullo dilectu, nulla elegantia: Philo et proprio numero et lecta poemata et loco adiungebat. Itaque postquam adamavi hanc quasi senilem declamationem, studiose equidem utor nostris poetis: sed, sicubi illi defecerunt, verti etiam multa de Graecis, ne quo ornamento in hoc genere disputationis careret Latina oratio.

2. Give the date of the Tusculans, and translate with a note where necessary the following:—

(*a*) Ab optimis illis quidem viris sed non satis eruditis.

(*b*) Acuti nec insulsi hominis, ut Siculi. Who is referred to?

(*c*) Non sentientis autem nihil est, ullam in partem quod intersit.

(*d*) Aspicite, o cives, senis Enni imaginis formam:
hic vestrum pinxit maxima facta patrum.

Add a note on the scansion and readng.

(*e*) Rationem illi sententiae suae non fere reddebant, nisi quid erat numeris aut descriptionibus explicandum.

(*f*) Errantium stellarum cursus, praegressiones, institiones.

(*g*) Contortulis quibusdam et minutis conclusiunculis nec ad sensum permanantibus.

QUINTILIAN.

1. Translate :—

Sed quemadmodum forensibus certaminibus exercitatos et quasi militantes reficit ac reparat haec velut sagina dicendi, sic adolescentes non debent nimium in falsa rerum imagine detineri et inanibus se simulacris usque adeo, ut difficilis ab his digressus sit, assuefacere, ne ab illa, in qua prope consenuerint, umbra vera discrimina velut quendam solem reformident. Quod accidisse etiam Porcio Latroni, qui primus clari nominis professor fuit, traditur, ut cum ei summam in scholis opinionem obtinenti causa in foro esset oranda, impense petierit, uti subsellia in basilicam transferrentur. Ita illi coelum novum fuit, ut omnis eius eloquentia contineri tecto ac parietibus videretur. Quare iuvenis, qui rationem inveniendi eloquendique a praeceptoribus diligenter acceperit (quod non est infiniti operis si docere sciant et velint) exercitationem quoque modicam fuerit consecutus, oratorem sibi aliquem, quod apud maiores fieri solebat, deligat, quem sequatur, quem imitetur; iudiciis intersit quam plurimis et sit certaminis, cui destinatur, frequens spectator.

2. Translate and comment on :—

(1) In lectione certius iudicium, quod audienti frequenter aut suus cuique favor aut ille laudantium clamor extorquet. Pudet enim dissentire, et velut tacita quadam verecundia inhibemur plus nobis credere, cum interim et vitiosa pluribus placent, et a corrogatis laudantur etiam quae non placent.

(2) Licet tamen nobis in digressionibus uti vel historico nonunquam nitore, dum in his, de quibus erit quaestio, meminerimus, non athletarum toros sed militum lacertos esse; nec versicolorem illam, qua Demetrius Phalereus dicebatur uti, vestem bene ad forensem pulverem facere.

(3) Multum enim supra prosam orationem et quam pedestrem Graeci vocant surgit, ut mihi non hominis ingenio sed quodam Delphico videatur oraculo instinctus.

(4) C. vero Caesar si foro tantum vacasset, non alius ex nostris contra Ciceronem nominaretur. Tanta in eo vis est, id acumen, ea concitatio, ut illum eodem animo dixisse, quo bellavit, appareat; exornat tamen haec omnia mira sermonis, cuius proprie studiosus fuit, elegantia.

(5) Ideo plerique, cum verba quaedam ex orationibus excerpserunt aut aliquos compositionis certos pedes, mire a se quae legerunt, effingi arbitrantur; cum et verba intercidant invalescantque temporibus, ut quorum

certissima sit regula in consuetudine, eaque non sua natura sint bona aut mala (nam per se soni tantum sunt) set prout opportune proprieque aut secus collocata sunt, et compositio cum rebus accommodata sit tum ipsa varietate gratissima.

(6) Sedutum maxime, cum facultas illa contigerit, resistamus et provideamus et ferentes equos frenis quibusdam coerceamus; quod non tam moram faciet quam novos impetus dabit. Neque enim rursus eos, qui robur aliquod in stilo fecerint, ad infelicem calumniandi se poenam alligandos puto. Nam quomodo sufficere officiis civilibus possit, qui singulis actionum partibus insenescat?

TACITUS.

I. Translate:—

Exim promptum quod multorum intimis questibus tegebatur. incedebat enim deterrimo cuique licentia impune probra et invidiam in bonos excitandi arrepta imagine Cæsaris; libertique etiam ac servi patrono vel domino, cum voces, cum manus intentarent, ultro metuebantur. igitur C. Cestius senator disseruit principes quidem instar deorum esse, sed neque a dis nisi iustas supplicum preces audiri, neque quemquam in Capitolium aliave urbis templa perfugere, ut eo subsidio ad flagitia utatur. abolitas leges et funditus versas, ubi in foro, in limine curiae ab Annia Rufilla, quam fraudis sub iudice damnauisset, probra sibi et minae intendantur, neque ipse audeat ius experiri ob effigiem imperatoris oppositam. haud dissimilia alii et quidam atrociora circumstrepebant, precabanturque Drusum daret ultionis exemplum, donec accitam convictamque attineri publica custodia iussit.

II. Translate and comment on:—

(1) Aberat quippe adulatio, gnaris omnibus laetam Tiberio Germanici mortem male dissimulari.

(2) mihi, quanto plura recentium seu veterum revolvo, tanto magis ludibria rerum mortalium cunctis in negotiis observantur. quippe fama spe veneratione potius omnes destinabantur imperio quam quem futurum principem fortuna in occulto tenebat.

(3) sexto demum consulatu Cæsar Augustus, potentiae securus, quae triumviratu iusserat abolevit.

(4) addito maiestatis crimine, quod tum omnium accusationum complementum erat.

(5) at hercule nemo refert, quod Italia externae opis indiget, quod vita populi Romani per incerta maris et tempestatum cotidie volvitur. ac nisi provinciarum copiae et dominis et servitiis et agris subvenerint, nostra nos scilicet nemora nostraeque villae tuebuntur.

(6) id summi fastigii vocabulum Augustus repperit, ne regis aut dictatoris nomen adsumeret ac tamen appellatione aliqua cetera imperia praemineret.

(7) praecipuum munus annalium reor, ne virtutes sileantur, utque pravis dictis factisque ex posteritate et infamia metus sit.

B.A. CLASSICAL HONOURS.

LATIN.

CICERO, *pro Cluentio* and *Brutus*.

SATURDAY, APRIL 7TH:—MORNING, 9 TO 12.

1. Translate:—

Atque idem quanto in odio postea suis illis ipsis fuit, per quos in altiorem locum adscenderat! Neque iniuria. Facite enim ut non solum mores eius et arrogantiam, sed etiam vultum atque amictum, atque illam usque ad talos demissam purpuram recordemini. Is, quasi non esset ullo modo ferendum se ex iudicio discessisse victum, rem ab subselliis in rostra detulit. Et iam querimur saepe, hominibus novis non satis magnos in hac civitate esse fructus? Nego usquam umquam fuisse maiores: ubi si quis ignobili loco natus ita vivit ut nobilitatis digni tatem virtute tueri posse videatur, usque eo pervenit quoad cum industria eum innocentia prosecuta est; si quis autem hoc uno nititur, quod sit ignobilis, procedit saepe longius quam si idem ille esset cum iisdem suis vitiis nobilissimus. Ut Quintius (nihil enim dicam de ceteris) si fuisset homo nobilis, quis eum cum illa superbia atque intolerantia ferre potuisset? Quod eo loco fuit, ita tulerunt, ut, si quid haberet a natura boni, prodesse ei putarent oportere, superbiam autem atque arrogantiam eius deridendam magis arbitrarentur propter humilitatem hominis, quam pertimescendam.

2. Translate and comment on:—

(1) ex petulanti atque improbo scurra, in discordiis civitatis, ad eam columnam, ad quam multorum saepe conviciis perductus erat, tum suffragiis populi pervenerat.

(2) Tum vero illa iudicia senatoria, non falsa invidia, sed vera atque insigni turpitudine notata, atque operta dedecore et infamia, defensioni locum nullum reliquissent.

(3) atque etiam ipse conditor totius negotii Guttam adspergit huic Bulbo.

(4) Adducti iudices sunt, non modo potuisse honeste ab eo reum condemnari, qui non perpetuo sedisset; sed, si aliud is iudex nihil scisset, nisi quae praeiuducia de eo facta esse constarent, audire praeterea nihil debuisse.

(5) maiestatis absoluti sunt permulti, quibus damnatis de pecuniis repetundis lites maiestatis essent aestimatae.

(6) Si ideo, quia subscripserint, videte, quid agatis, ne * * * * censorium stilum, cuius mucronem multis remediis maiores nostri retuderunt, aeque posthac atque illum dictatorium gladium pertimescamus.

(7) Habitus ne hoc quidem unquam recusavit, quo minus vel ea lege rationem vitae suae redderet, qua non teneretur.

3. Give the meaning of:—*actio prima, rumusculos aucupari, in aerarios referre, supposita persona, praevaricari accusationi, nomen deferre, obsignatores, harenariae, heredes secundi, verbis conceptis peierare.*

4. Translate:—

Tum Brutus, 'Quid tu igitur,' inquit, 'tribuis istis externis quasi oratoribus?' 'Quid censes,' inquam, 'nisi idem quod urbanis? praeter unum, quod non est eorum urbanitate quadam quasi colorata oratio. Et Brutus, 'Qui est,' inquit, 'iste tandem urbanitatis color?' 'Nescio,'' inquam; 'tantum esse quendam scio. Id tu, Brute, iam intelleges cum in Galliam veneris. Audies tu quidem etiam verba quaedam non trita Romae, sed haec mutari dediscique possunt; illud est maius, quod in vocibus nostrorum oratorum retinnit quiddam et resonat urbanius; nec hoc in oratoribus modo apparet, sed etiam in ceteris. Ego memini T. Tincam Placentinum hominem facetissimum cum familiari nostro Q. Granio praecone dicacitate certare.' 'Eon,' inquit Brutus, 'de quo multa Lucilius?' Isto ipso: sed Tincam non minus multa ridicule dicentem Granius obruebat nescio quo sapore vernaculo; ut ego iam non mirer illud Theophrasto accidisse, quod dicitur, cum percontaretur ex anicula quadam quanti aliquid venderet et respondisset illa atque addidisset "hospes, non pote minoris," tulisse eum moleste se non effugere hospitis speciem, cum aetatem ageret Athenis optimeque loqueretur. Omnino sic, ut opinor, in nostris est quidam urbanorum, sicut illic Atticorum sonus.

5. Translate and comment on:—

(1) Qua re quoniam tibi ita quadrat omnia fuisse Themistocli paria et Coriolano, pateram quoque a me sumas licet; praebebo etiam hostiam, ut Coriolanus sit plane alter Themistocles.

(2) Eodemque in genere est habitus is, qui iniuria accepta fregit Ti. Gracchum patientia, civis in rebus optimis constantissimus M. Octavius.

(3) Quibus virtutibus oratoris horum quidque efficiatur aut quibus vitiis orator aut non adsequatur haec aut etiam in his labatur et cadat, artifex aliquis iudicabit; efficiatur autem ab oratore necne, ut ei qui audiunt ita adficiantur ut orator velit, volgi adsensu et populari approbatione iudicari sole'.

(4) Eodem tempore C. L. Caepasii fratres fuerunt, qui multa opera, ignoti homines et repentini, quaestores celeriter facti sunt, oppidano quodam et incondito genere dicendi.

(5) doctus Hermagorae praeceptis, quibus etsi ornamenta non satis opima dicendi, tamen, ut hastae velitibus amentatae, sic apta quaedam et parata singulis causarum generibus argumenta traduntur.

6. Give the meaning of *legem suadere, locuples auctor, flos delibatus populi Suadaeque medulla, fabulam docere, veterator, rogationem privilegii similem ferre, fidem implorare, lex tabellaria, quaestiones perpetuae, repulsam ferre, multam petere, vendibilis orator, mittere ad horas.*

7. (1) Give a short sketch of the history of ancient oratory.

(2) What are the five parts (1) of oratory, (2) of an oration.

(3) Illustrate by references to examples the main sources of corruption in the MSS of the *pro Cluentio.*

B. A. CLASSICAL HONOURS.

LATIN PROSE COMPOSITION.

SATURDAY, APRIL 7TH:—AFTERNOON, 2 TO 5.

I.

I know that it has been asserted by the advocates of the right honourable gentleman out of doors that that reply was complete; but sure I am that no man in this house who heard it ever thought it so, and least of all was it so thought by my right honourable friend himself, who delivered it. I admire the talents of my right honorouble friend as much as any man, yet, upon the occasion alluded to, I could not help observing the difficulty he had to struggle with; the embarrassed and staggering course

he made; I was conscious that my right honourable friend felt that he had very little to say to the purpose; that he was sailing against wind and tide; that, although the puff of a cheer from his friends sometimes produced a slight swell in his sails, he could make but little progress; that he raised his voice aloud, but produced no impression; that he dropped argument and produced a noise; that, in fact, he made a fine speech and plenty of noise, but did little mischief to his adversary at least. What mischief he may have done to the system he would support I cannot pretend to say.

II.

Among the more obvious merits of Lysias were the purity of his diction and the simplicity of his composition. His Roman admirers, supposing that these were easily imitated, aimed exclusively at these to the neglect of his other merits. Of his truth to character, his faithfulness to nature and his consummate skill in concealing his art, they were entirely unconscious; while his subtle and evanescent charm could not be caught and reproduced by his rude Roman admirers. Those who found themselves repelled by the studiously rhythmical and elaborately Isocratean style of Cicero were probably attracted to Lysias, not merely by his apparent easiness, but also by his refraining from any elaborate striving after periodic rhythm; but the cold and dry manner of these inadequate imitators of imperfectly apprehended models failed to win the ear of Roman audiences which were still under the magic spell of the musical periods of Cicero.

CLASSICAL HONOURS.

LATIN.

ELEGIAC POETS.

MONDAY, APRIL 16TH:—MORNING, 9 TO 12.

1. Translate:—

(*a*) Quam potius laudandus hic est, quem prole parata
occupat in parva pigra senecta casa:
ipse suas sectatur oves, at filius agnos,
Et calidam fesso comparat uxor aquam.
Sic ego sim, liceatque caput candescere canis,
temporis et prisci facta referre senem.
Interea Pax arva colat. Pax candida primum
duxit araturos sub iuga panda boves,
pax aluit vites et sucos condidit uvae,
funderet ut nato testa paterna merum:
pace bidens vomerque vigent, at tristia duri
militis in tenebris occupat arma situs.

(*b*) Uvidulam a fletu cedentem ad templa deum me
sidus in antiquis diva novom posuit :
virginis et saevi contingens namque Leonis
lumina, Callisto iuncta Lycaoniae,
vertor in occasum, tardum dux ante Booten,
qui vix sero alto mergitur Oceano.
Sed quamquam me nocte premunt vestigia divom,
lux autem canae Tethyi restituit,
(pace tua fari hic liceat, Rhamnusia virgo,
Namque ego non ullo vera timore tegam,
nec si me infestis discerpent sidera dictis,
condita quin veri pectoris evoluam) :
non his tam laetor rebus, quam me afore semper,
afore me a dominae vertice discrucior,
quicum ego, dum virgo curis fuit omnibus expers,
ungenti Surii milia multa bibi.

(*c*) Terra parum fuerat fatis, adiecimus undas :
fortunae miseras auximus arte vias,
Ancora te teneat, quem non tenuere Penates ?
Quid meritum dicas, cui sua terra parumst ?
Ventorumst, quodcunque paras : haut ulla carina
consenuit, fallit portus et ipse fidem.
Naturâ insidians pontum substravit avaris :
ut tibi succedat, vix semel esse potest.
Saxa triumphales fregere Capharea puppes,
naufraga cum vasto Graecia tracta salost.
Paulatim socium iacturam flevit Ulixes,
in mare cui soliti non valuere doli,
Quod si contentus patrio bove verteret agros,
verbaque duxisset pondus habere mea,
viveret ante suos dulcis conviva Penates,
pauper, at in terra, nil ubi flare potest.

2. Translate and comment on the allusion, *or*—where necessary—on the reading or scansion of the following :—

(*a*) The last line of extract (*c*) above :

(*b*) Graia Canopeis incola litoribus :

(*c*) lentaque sorore
flammati Phaethontis :

(*d*) Caesio veniam obvius leoni :

(*e*) Odissem te odio Vatiniano :

(*f*) Commode enim volo ad Sarapim deferri :

(*g*) Insignis turba in Pharia :

(*h*) In cava Lethaeas dolia portat aquas :
(*i*) An te, Cydne, canam ?
(*k*) Iam reor hoc ipsos edidicisse deos :
(*l*) Dicitur occurrens erubuisse soror :
(*m*) At tibi laeta trahant Samiae convivia testae :
(*n*) Usque cano Nemesim, sine qua versus mihi nullus.
(*o*) Fluminaque Haemonio comminus isse viro :
(*p*) Tinguunt Gorgonio punica rostra lacu :
(*q*) Et tu materno tacta dolore Theti :
(*r*) Et cecinisse modis, Coe poeta, tuis :
(*s*) Atridae magno cum stetit alter amor :
(*t*) Aurora exoriente vagi sub lumina solis :
(*u*) Nulla fugae ratio, nulla spes : omnia muta :
(*v*) Prona cadit, late quast impetus obvia frangens ;
(*w*) Cinge tempora floribus
Suave olentis amaraci.

3: Quote what you can of not more than three of the following :
(*a*) Lines expressing Tibullus' love of country life ;
(*b*) Lines in which Tibullus pictures the world of spirits ;
(*c*) Ariadna's lament ;
(*d*) Lines beginning "ut flos in saeptis secretus nascitur hortis."
(*e*) Lines beginning "vivamus, mea Lesbia, atque amemus."
(*f*) Lines in which Propertius alludes to celebrated Greek artists.

B.A. HONOURS IN CLASSICS.

LATIN.

PLAUTUS, *Rudens*. HORACE, *Odes I and II*. VIRGIL, *Aeneid X-XII*.

TUESDAY, APRIL 17TH :—MORNING, 9 TO 12.

I. PLAUTUS.

1. Translate :—

Gr. Perii hercle ego miser : tu prius quam plane aspexisti ilico
eum esse dixti. Pa. Faciam ego hanc rem ex proclivi planam tibi.
Cistellam isti inesse oportet caudeam in isto vidulo :
ibi ego dicam quicquid inerit nominatim : tu mihi
nullum ostenderis. Si falsa dicam, frustra dixero :
vos tamen istaec quicquid inerit vobis omne habebitis.

7 si erunt vera, tum obsecro te, ut mea mi reddantur.
Dae Placet,
8 ius merum oras meo quidem animo. Gr. At meo
hercle inius merum.
Quid, si ista aut superstitiosa aut hariolast atque omnia
quidquid inerit vera dicet? anne habebit hariola?

2. Scan the following lines and name the metres:—

(*a*) Lines 7 and 8 above.

(*b*) Salute horiae quae in mari fluctuoso.

(*c*) Iam ubi liber ero, igitur demum mi instruam
agrum atque aedis, mancipia.

(*d*) Post animi causa mihi navem faciam atque imitabor Stratonicum.

(*e*) Ad hirundininum nidum visast simia.

(*f*) Domum redimus clanculum dormimus incenati.

(*g*) Nempe equo ligneo per vias caerulas.

3. Emend the following:—

(*a*) Ut quom exissem ex aqua arerem tamen,

b) Postid sicilicula argenteola et duae conexae maniculae.

4. A note on the words, *abitat, manduco, interduim, pervenat, clavator, curriculo, praeposivi, dierecta, postid, exicus, es, hisce, adgredimur, rudens.*

II. HORACE.

1. Translate, with brief notes:—

(*a*) O navis, referent in mare te novi
fluctus. O quid agis? Fortiter occupa
portum. Nonne vides, ut
nudum remigio latus,
et malus celeri saucius Africo
antennaeque gemunt; ac sine funibus
vix durare carinae
possunt imperiosius
aequor?

(*b*) Vile potabis modicis Sabinum
cantharis, Graeca quod ego ipse testa
conditum levi, datus in theatro
cum tibi plausus,

care Maecenas eques, ut paterni
fluminis ripae, simul et iocosa
redderet laudes tibi Vaticani
montis imago.

(*c*) O saepe mecum tempus in ultimum
deducte Bruto militiae duce,
quis te redonavit Quiritem
dis patriis Italoque caelo,

Pompei, meorum prime sodalium,
cum quo morantem saepe diem mero
fregi coronatus nitentis
malobathro Syrio capillos.

(*d*) Quid, quod usque proximos
revellis agri terminos, et ultra
limites clientium
salis avarus? Pellitur paternos
in sinu ferens deos
et uxor et vir sordidosque natos.
Nulla certior tamen,
rapacis Orci fine destinata
aula divitem manet
erum.

III. VIRGIL.

1. Translate, explaining words or phrases in *italics*:

(*a*) Interea soror alma monet succurrere Lauso
Turnum, qui volucri curru medium secat agmen.
Ut vidit socios: "Tempus desistere *pugnae*;
Solus ego in Pellanta *feror*; soli mihi Pallas
Debetur; *cuperem* ipse parens spectator *adesset*."
Haec ait; et socii cesserunt aequore iusso.
At *Rutulum* abscessu, iuvenis tum iussa superba
Miratus stupet in Turno, corpusque per ingens
Lumina volvit, obitque truci procul omnia visu.

(*b*) Tum *Drances*, idem infensus, quem gloria Turni
Obliqua invidia stimulisque agitabat amaris,
Largus *opum* et lingua melior, sed frigida *bello*
Dextera, consiliis habitus non *futilis* auctor,
Seditione potens—genus huis materna superbum
Nobilitas dabat, incertum de patre ferebat—
Surgit, et his onerat dictis atque aggerat *iras*:
"Rem nulli obscuram, nostrae nec vocis egentem,
Consulis, o bone rex. Cuncti se scire fatentur,
Quid fortuna ferat populi; sed *dicere* mussant.

(*c*) Iunonem interea Rex omnipotentis Olympi
Alloquitur, fulva pugnas de nube tuentem:

"Quae iam finis erit, coniux? quid denique restat?
Indigetem Aenean scis ipsa, et scire fateris,
Deberi caelo, fatisque ad sidera tolli.
Quid struis? aut qua spe gelidis in nubibus haeres?
Mortalin' decuit violari vulnere divum?
Aut ensem—quid enim sine te Iuturna valeret?—
Ereptum reddi Turno, et vim crescere victis?
Desine iam tandem, precibusque inflectere nostris;
Nec te tantus edat tacitam dolor; et mihi curae
Saepe tuo dulci tristes ex ore recursent.

B. A. HONOURS IN CLASSICS.

LATIN SIGHT TRANSLATION.

WEDNESDAY, APRIL 18TH:—AFTERNOON, 2 TO 5.

I.

Neque hic tamen ulla umquam iniuria adducetur ut eum tali virtute tantaque firmitate animi se in rem publicam fuisse paeniteat: sed qui haec vident adulescentes, quonam suas mentes conferent? Ille, bui monumenta publica, qui aedes sacras, qui domos inimicorum suorum oppugnavit, exscidit, incendit, qui stipatus semper sicariis, saeptus armatis, munitus indicibus fuit, quorum hodie copia redundat, qui et peregrinam manum facinorosorum concitavit et servos ad caedem idoneos emit et in tribunatu carcerem totum in forum effudit, volitat aedilis, accusat eum qui aliqua ex parte eius furorem exsultantem repressit: hic, qui se est tutatus sic, ut in privata re deos penates suos, in re publica iura tribunatus atque auspicia defenderet, accusare eum moderate, a quo ipse nefarie accusatur, per senatus auctoritatem non est situs.—CICERO.

II

Ego, si me aliquando vestri et patriae compotem fortuna fecerit, certe efficiam ut maxime laetere unus ex omnibus amicis, meaque officia et studia, quae parum antea luxerunt—fatendum est enim—, sic exsequar, ut me aeque tibi ac fratri et liberis nostris restitutum putes. Si quid in te peccavi, ac potius quoniam peccavi, ignosce; in me enim ipsum peccavi vehementius. Neque haec eo scribo, quo te non meo casu maximo dolore esse adfectum sciam, sed profecto, si, quantum me

amas et amasti, tantum amare deberes ac debuisses, numquam esses passus me, quo tu abundabas, egere consilio, nec esses passus mihi persuaderi utile nobis esse legem de collegiis perferri. Sed tu tantum lacrimas praebuisti dolori meo, quod erat amoris, tamquam ipse ego; quod meritis meis perfectum oportuit, ut dies et noctes, quid mihi faciendum esset, cogitares, id abs te meo, non tuo scelere praetermissum est. Quod si non modo tu, sed quisquam fuisset, qui me Pompeii minus liberali responso perterritum a turpissimo consilio revocaret, quod unus tu facere maxime potuisti, aut occubuissem honeste aut victores hodie viveremus.—CICERO.

III

Inde soporifero cesserunt languida somno
Membra ducis. Diri tum plena horroris imago
Visa caput moestum per hiantes Iulia terras
Tollere et accenso furialis stare sepulchro.
'Sedibus Elysiis, campoque expulsa piorum
Ad Stygias, inquit, tenebras manesque nocentes
Post bellum civile trahor. Vidi ipsa tenentes
Eumenidas quaterent quas vestris lampadas armis:
Praeparat innumeras puppes Acherontis adusti
Portitor: in multas laxantur Tartara poenas.
Vix operi iunctae dextra properante sorores
Sufficiunt: lassant rumpentes stamina Parcas.
Coniuge me laetos duxisti, Magne, triumphos:
Fortuna est mutata toris: semperque potentes
Detrahere in cladem fato damnata maritos,
En nupsit tepido pellex Cornelia busto.
Haereat illa tuis per bella, per aequora signis,
Dum non securos liceat mihi rumpere somnos,
Et nullum vestro vacuum sit tempus amori,
Sed teneate Caesarque dies, et Iulia noctes.
e non Lethaeae, coniux, oblivia ripae
Immemorem fecere tui, regesque silentum
Permisere sequi. Veniam, te bella gerente,
In medias acies. Numquam tibi, Magne, per umbras
Perque meos manes genero non esse licebit.
Abscidis frustra ferro tua pignora. Bellum
Te faciet civile meum.' Sic fata, refugit
Umbra per amplexus trepidi dilapsa mariti.

LUCAN.

IV.

Marcellus non suam sententiam inpugnari, sed consulem designatum censuisse dicebat, secundum vetera exempla, quae sortem legationibus dosuissent, ne ambitioni aut inimicitiis locus foret. Nihil evenisse cur antiquitus instituta exolescerent aut principis honor in cuiusquam contumeliam verteretur; sufficere omnes obsequio. Id magis vitandum, ne pervicacia quorundam inritaretur animus novo principatu suspensus et voltus quoque ac sermones omnium circumspectans. Se meminisse temporum quibus natus sit, quam civitatis formam patres avique instituerint; ulteriora mirari, praesentia sequi; bonos imperatores voto expetere, qualescumque tolerare. Non magis sua oratione Thraseam quam iudicio senatus adflictum; saevitiam Neronis per eiusmodi imagines inlusisse, nec minus sibi anxiam talem amicitiam quam aliis exsilium. Denique constantia fortitudine Catonibus et Brutis aequaretur Helvidius: se unum esse ex illo senatu qui simul servierit. Suadere etiam Prisco ne supra principem scanderet, ne Vespasianum senem triumphalem, iuvenum liberorum patrem, praeceptis coërceret. Quomodo pessimis imperatoribus sine fine dominationem, ita quamvis egregiis modum libertatis placere.—TACITUS.

CLASSICAL HONOURS.—THIRD AND FOURTH YEARS.

LATIN.

SATURDAY, APRIL 21ST:—MORNING, 9 TO 12.

I. JUVENAL.

1. Translate, with comments on leading points:—

(*a*) Pone Tigellinum, taeda lucebis in illa,
Qua stantes ardent, qui fixo gutture fumant,
Et latum media sulcum deducit arena.

(*b*) Si magna Asturici cecidit domus, horrida mater,
Pullati proceres, differt vadimonia praetor;
Tunc gemimus casus urbis, tunc odimus ignem.

(*c*) Curandum imprimis, ne magna iniuria fiat est
Fortibus et miseris: tollas licet omne, quod usquam est
Auri atque argenti, scutum gladiumque relinques
Et iacula et galeam; spoliatis arma supersunt.

(*d*) Quid, si vidisset praetorem curribus alti
Exstantem et medio sublimem in pulvere Circi,
In tunica Iovis, et pictae Sarrana ferentem
Ex humeris aulaea togae magnaeque coronae
Tantum orbem, quanto cervix non sufficit ulla?

(*e*) Chrysippus non dicet idem nec mite Thaletis
Ingenium dulcique senex vicinus Hymeto,
Qui partem acceptae saeva inter vincla ecutae
Accusatori nollet dare. Plurima felix
Paullatim vitia atque errores exuit omnes,
Prima docet rectum Sapientia: quippe minuti
Semper et infirmi est animi exiguique voluptas
Ultio.

(*f*) "Haec ego nunquam
Mandavi," dices olim, "nec talia suasi."
Mentis causa malae tamen est et origo penes te.
Nam quisquis magni census praecepit amorem
Et laevo monitu pueros producit avaros
Et qui per fraudes patrimonia conduplicare
Dat libertatem, et totas effundit habenas
Curriculo: quem si revoces, subsistere nescit,
Et te contempto rapitur metisque relicti.

II. PERSIUS.

Translate, with explanatory notes on words or phrases in italics;

(*a*) "Fur es" ait Pedio. Pedius quid? crimina rasis
Librat in antithetis: doctas *posuisse* figuras
Laudatur "bellum hoc!" hoc bellum? an, Romule, ceves?
Men moveat quippe, et, cantet si naufragus, assem
Protulerim? Cantas, cum fracta te *in tribe pictum*
Ex umero portes? *verum*, nec nocte *paratum*
Plorabit, qui me volet incurvasse querela.

(*b* Si tibi *creterras* argenti incusaque pingu
Audona feram, sudes et pectore laevo
Excutiat guttas laetari praetrepidum cor
Hinc illud subiit, auro sacras quod ovat
Perducis facies; nam '*fratres* inter *aeris*
Somnia pituita qui purgatissima mittunt
Praecipui sunto sitque illis aurea barba.

(*c*) Saepe oculos, memini, tingebam parvus olivo,
Grandia si nollem morituri verba Catonis
Discere, *non sano* multum *laudanda* magistro,
Quae pater adductis sudans audiret amicis.
Iure: etenim id summum, quid dexter *senis* ferret,
Scire erat in voto; damnosa canicula quantum
Raderet; angustae collo non fallier orcae;
Neu quis callidior buxum torquere flagello.

(*d*) Scis etenim iustum gemina suspendere lance
Ancipitis librae, rectum discernis, ubi inter
Curva subit, vel cum fallit pede regula varo,
Et potis es nigrum vitio praefigere *theta*.

(*e*) O bone, num ignoras? missa est a Caesare *laurus*
Insignem ob cladem Germanae pubis, et aris
Frigidus excutitur cinis, ac iam postibus arma,
Iam chlamydes regum, iam lutea *gausapa* captis
Essedaque ingentesque locat Caesonia Rhenos.

III.

1. Write briefly on

(*a*) The Ancient Biographies of Juvenal, *or*

(*b*) The Satura before Juvenal.

2. Discuss the following MS. readings, giving proposed emendations:

(*a*) Ergo ut miremur te, non tua, primum aliquid da

(*b*) Quisquis adhuc uno parcam colit asse Minervam

(*c*) Rursus ad Aethiopum populos altosque elephantos.

3. Give two or more interpretations of the following lines:

(*a*) Credimus altos
Defecisse amnes epotaque flumina Medo
Prandente et madidis cantat quae Sostratus alis.

(*b*) Plurima felix
Paulatim vitia atque errores exuit omnes
Prima docet rectum sapientia.

(*c*) Quanti sua funera vendant,
Quid refert? vendunt nullo cogente Nerone,
Nec dubitant celsi praetoris vendere ludis.

MATHEMATICS AND NATURAL PHILOSOPHY.

FIRST YEAR SESSIONAL EXAMINATION.

PHYSICS.

TUESDAY, APRIL 17TH :—MORNING, 9 TO 12.

1. A force of 240 lbs. weight acts on a mass of 600 lbs. for 5 seconds Find the velocity acquired and the distance travelled.

2. In a waterfall 5400 cubic feet of water descend 120 feet every minute. If a cubic foot of water weights 1000 ounces, what is the horse-power of the fall?

3. Define the Moment of a force about a point, and use the term to state the principle of the Lever.

4. Explain the principle of Archimedes concerning floating bodies, and give a proof of it. An object weighs 2.34 ounces in air and its specific gravity is 11.2. What will it weigh in water?

5. If a tuning fork be held over the mouth of a tube of a certain length its note is strongly re-enforced. Explain this and find the proper length of tube if the fork make 480 vibrations per second and the velocity of sound is 1120 feet per second.

6. On what do the pitch and quality of musical notes depend? How are vowel sounds produced in ordinary speech?

7. Given a convex lens of 2 inches focal length. Where must an object be placed so as to form an image 10 inches from the lens, (1) on the same side, (2) on the other side of the lens?

8. How is a spectrum formed? What conclusions as to the nature of white light do you draw from it? Explain why a dark line is found in the orange of the solar spectrum where a sodium flame would give a bright line.

9. Describe the construction and action of a Thermopile.

10. 840cc of gas at 10° C and 29 inch pressure are raised to 84° C and 87 inches pressure. What will be the new volume?

11. Briefly describe the chief experiments of Rumford and Joule on the nature of Heat. What conclusions do you draw from each?

12. What are the principal points to be attended to in putting up lightning-rods? Give reasons. Can you account for the faillure of such arrangements to protect in every case?

13. Describe a Daniell's Cell, and point out what it was intended to avoid. The resistance of a cell is 4 Ohms and its E.M.F. 1.079 Volts. What current will it send through a wire of 10.4 Ohms resistance?

14. Describe Oerstedt's experiment with a current and a magnet; mention the essential parts of a modern electric motor, and point out its relation to Oerstedt's experiment.

SESSIONAL EXAMINATION.

THIRD YEAR ARTS, AND FIRST AND SECOND YEARS APPLIED SCIENCE.

EXPERIMENTAL PHYSICS. HEAT, SOUND AND LIGHT.

THURSDAY, APRIL 5TH—MORNING, 9 TO 12.

1. Upon what does the velocity of sound in air depend? Shew that it is not affected by a fall in the barometer. If the velocity at freezing-point is 1086 feet per second, find its value for 35° C.

2. Explain in detail how you would find the vibration-number of a tuning-fork by means of a Sonometer.

3. Give a brief general account of the production of (*a*) vowels, (*b*) consonants in human speech.

4. Quote the formula connecting the distances of an object and its image from the lens forming it. Where must a convex lens of focal length 2 inches be placed so as to form (1) a real image at 10 inches from the lens (2) a virtual image at 10 inches from the lens? Draw a diagram for the latter case, tracing a pencil of rays from a point not on the axis to an eye behind the lens, and find the magnification of the object.

5. Describe carefully the adjustments of a spectrometer. How would you use it to determine the index of refraction of a given prism for the line D? Give the formula.

6. Explain Refraction (1) on the Corpuscular Theory, (2) on the Undulatory Theory. What is the importance of this point in a comparison of the theories?

7. How does Plane-polarized Light differ from Common Light? Explain the action of a Nicol's Prism. Describe the Saccharimeter, stating clearly the property of sugar on which it depends.

8. Briefly describe (1) a thermopile, (2) a platinum resistance thermometer.

9. State Charles' Law for the expansion of a gas with temperature. Describe the air thermometer at constant volume, and the method of using it to determine the coefficient of expansion of a gas.

10. Give the Specific and Latent Heats of ice. How much ice at 10° C below zero will be required to cool 25 lbs. of water from 55° C to 18° C?

11. Describe some form of Hygrometer. Explain the terms, Dew-Point, Relative Humidity. The pressure of water vapour is 23.55 mm at 25° and 15.357 mm at 18°. What is the relative humidity at 25°, when the Dew-Point is found to be 18°?

12. What is an Indicator Diagram? Explain how it is used to find the Horse-power of an engine.

13. Compare the theoretically possible efficiency of an engine working between 20° C and minus 180° C with that of one working between 300° F and 110° F.

FOURTH YEAR ARTS AND THIRD YEAR APPLIED SCIENCE.

EXPERIMENTAL PHYSICS, ELECTRICITY AND MAGNETISM.

MONDAY, APRIL 2ND:—MORNING, 9 TO 12.

1. What is meant by a "magnetic line of force"?
Show how the lines of force for a uniformly magnetised bar magnet can be drawn from theory. Sketch the lines of force for a uniformly magnetised bar magnet and also for an ordinary bar magnet. Give the relations between the pole strength, magnetic moment and intensity of magnetization of a magnet.

2. A bar magnet 10 cms. long is placed in the meridian with its *N* pole pointing northwards. A small compass needle is found to be in neutral equilibrium 20 cms. vertically above the centre of the bar. Find the magnetic moment and pole strength of the magnet.

3. Contrast the magnetic properties of soft iron and steel. Define the terms permeability and total induction in iron.
Why cannot a bar magnet be made out of soft iron?

4. State the laws of heating by the electric current.
A 100 volt lamp taking .6 amperes is placed inside a vessel holding a litre of water. Find the time required to raise the temperature of the water through 10°C assuming no loss of heat by radiation, etc.

5. Explain the construction and action of a Daniell's cell.

3 Daniell's cells, *EMF* 1 volt, internal resistance 5 ohms, send a current through 3 and 4 ohms arranged in parallel.

Find the current in the circuit.

(*a*) with cells in series.

(*b*) with cells in parallel.

6. What is meant by Ohm's Law?

Show how to compare the values of two low resistances by the fall of potential method.

If a copper bar 2 metres long, ·3 cms. in diameter, has the same resistance as a bar of iron 150 cms. long and 1 cm. in diameter, compare the specific resistance of iron and copper.

7. State Faraday's Laws of induced currents.

An earth coil is rotated on a horizontal axis which is parallel to the meridian. The number of turns on coil is 100, and the mean area 1000 sq. cms. If the vertical component of the earth's magnetic field is .5 dynes, find the maximum and average *EMF* induced in the circuit when the coil makes 10 revolutions per sec.

8. Explain the construction and action of an induction coil. What is the function of the condenser attached? Why is the shock from a small induction coil diminished by sliding a brass cylinder over the primary?

9. Define unit charge, potential at a point, equipotential surface.

Draw the equipotential surfaces differing by unity round a small sphere charged with 10 units of electricity. Show from first principles that the rate of working in a circuit conveying a current is equal to the product of the current strength and the potential difference of terminals of circuit.

10. Explain the action of a water dropping accumulator. Whence is the energy of the electrification derived?

11. Explain the action of:—

(*a*) duplex method of signalling;

(*b*) receiver of a telephone.

12. Explain the different kinds of windings of a dynamo. Discuss what kind of winding is necessary in order to supply current to a number of arc lights in parallel.

THIRD YEAR SESSIONAL EXAMINATION.

ASTRONOMY—OPTICS.

TUESDAY, APRIL 10TH:—MORNING, 9 TO 12.

Write the answers in separate books marked A and B respectively to correspond to the questions.

A.

1. The days are getting longer as we now pass from winter into summer; explain the cause; and show why the days are shortening at the Cape of Good Hope.

2. State arguments to prove that the Earth is on the whole spherical in shape. Explain why it bulges out at the equator.

3. State what you know of the size of the Moon; its distance from us; its time of revolution round the Earth; its rotation on an axis; and the plane of its orbit.

4. What are the reasons for supposing that the Moon has no atmosphere?

5. Describe the appearance of the Sun's surface as seen through a telescope, and give a general statement of the amount of heat and light it sends out.

6. Give a general description of the appearance of a Comet, and of the changes that sometimes take place. State its nature.

B.

7. Explain clearly the difference between a real and a virtual image formed by reflection at the surface of any reflecting substance. Show by means of diagrams the three different positions which the image of an object, placed in front of a concave mirror, may take according as the object is placed farther away from the mirror than the length of the radius, between the centre and the principal focus or between the principal focus and the mirror.

8. Explain what is meant by the terms critical angle and total reflection. If the critical angle for a given substance is $60°$, find the refractive index of the substance.

9. What is meant by the term, minimum deviation? Deduce the formula for finding the refractive index of any refracting material made into the form of a prism, namely,

$$\mu = \frac{\sin\left(\frac{D+I}{2}\right)}{\sin\frac{I}{2}}$$

A prism whose angle is 60° is placed in the position of minimum deviation for a narrow beam of homogeneous light. It is found that the beam is deviated from its original path by an angle of 30°. Find the refractive index of the substance composing the prism.

10. Prove the general formula for a lens connecting the distances of an object and its image from the lens and the focal length of the lens,

$$\frac{1}{d} - \frac{1}{D} = \frac{1}{f}$$

An object 2 inches in length is placed 4 inches in front of a lens and an image is formed on the other side at a distance of 10 inches from the lens. Find the nature and focal length of the lens and also the size of the image.

11. Describe clearly the ordinary causes of long-sightedness and of short sightedness in the human eye. Explain fully how these defects may be remedied by means of spectacles. Find the nature and the focal length of the lenses which a person would require to use whose ordinary distance of distinct vision is 15 inches.

12. Describe fully Hadley's Sextant. Prove the principle involved in its use, namely, that the angle between the direction of the incident ray and that of the ray after having been twice reflected is equal to twice the angle between the two mirrors.

B.A. ORDINARY.

ASTRONOMY—OPTICS.

TUESDAY, APRIL 10TH:—MORNING, 9 TO 12.

Write the answers in separate books marked A and B respectively to correspond to the questions.

A.

1. A shipmaster leaving Liverpool is wrecked on an unknown island in the Pacific on March 21st, which happens to be a bright day after long continued cloudy weather. He wishes to lay down the position of the island on a chart, but the ship's instruments are lost. He has, however, a good watch in his pocket, which has been kept going regularly throughout the voyage, how may he find the position approximately?

2. How is it known to a certainty that the sun is much farther away from us than the moon? State the general principle only; applicable also to the distances of the fixed stars. How is it known that the Sun is much larger than the Moon?

3. Explain with the aid of a diagram the relative lengths of day and night throughout the year at Montreal. How would you find by means of the celestial globe the times of sunrise and sunset on the 21st June and 21st December respectively.

4. Calculate the periodic time of Mercury, the interval between two inferior conjunctions being 115.88 days. Prove any formula employed.

5. Calculate approximately the length of the earth's shadow. What is the effect when the Moon gets into it, and why? What, when *we* get into it, and why?

6. Define *sidereal* day, *solar* day and *mean solar* day.

B.

7. State the laws of reflection of light and deduce the formula for reflection at the surface of a concave mirror, namely

$$\frac{1}{d} + \frac{1}{D} = \frac{2}{r}.$$

An object 5 cms. in length is placed 30 cms. in front of a concave mirror of 5 cms. focal length. Find where the image will be formed and also the size of the image.

8. Define dispersive power of a substance. If the refractive index of red rays in fluor spar is 1.429 and that of violet rays is 1.439, find the dispersive power of fluor spar, given mean refractive index is 1.434.

9. Show by means of a diagram how it is that an object when placed below the surface of a liquid appears to be nearer the surface than *it* really is.

A coin placed at the bottom of a vessel filled with water appears to be 12 inches below the surface; what is its true depth if the refractive index of water is $\frac{4}{3}$?

10. Show that the deviation of a ray of light produced by a thin lens is given by the equation,

$$\delta = (\mu - 1)\, A \left(\frac{1}{r} - \frac{1}{r^1} \right)$$

where μ = refractive index, A = semi-aperture of the lens and r and r^1 are the radii of the two spherical surfaces enclosing the lens.

11. Describe fully, using a diagram, the simple microscope.

If the focal length of the object glass is .3 inch and that of the eye-glass is 1.4 inch, and the object is placed in front of the object glass at a distance of .35 inch, find the magnifying power of the instrument supposing it is used by a person whose distance of distinct vision is 10 inches.

12. What is meant by an achromatic combination of lenses? Show that in order that two lenses may achromatize one another their dispersive powers must be proportional to their focal lengths.

FIRST YEAR SESSIONAL EXAMINATION.

GEOMETRY AND ARITHMETIC.

MONDAY, APRIL 9TH:—MORNING, 9 TO 12.

A.

1. The opposite angles of any quadrilateral inscribed in a circle are together equal to two right angles. State and prove the converse.

2. Describe an isosceles triangle having each of the base angles double the vertical angle.

(*a*) Divide a right angle into five equal parts.

3. Find a mean proportional between two given straight lines.

4. In a right angled triangle, any rectilineal figure described on the hypothenuse is equal to the sum of the two similar and similarly described figures on the sides containing the right angle.

5. If the food of 11 persons for 13 weeks cost $560.66, what will it cost to feed 26 persons for 11 weeks 5 days?

6. Find the change in income which would result from selling 36 shares of 6 per cent. stock at 120 and investing the proceeds in 5½ per cent. stock at 108, the par value being $100 in each case.

B.

7. In equal circles, angles, whether at the centres or at the circumferences, have the same ratio as the arcs on which they stand.

8. On a given straight line describe a pentagon which shall be similar to a given pentagon.

9. If from a point without a circle two lines be drawn, one to cut the circle and the other to touch it, the rectangle contained by the whole line which cuts the circle and its external segment is equal to the square or the touching line.

(*a*) Find the locus of the point of intersection of equal tangents to two circles which cut each other.

10. Circumscribe a square about a given circle.

(*a*) Show that the circumscribed square is double the square that can be inscribed in the circle.

11. Find the present worth of $25,000 due four years hence at 5 per cent. simple interest. Find also the difference between the true and bank discount for the same time and at the same rate.

12. Express $\dfrac{5\frac{2}{3}}{2\frac{1}{3} - \frac{4}{3\frac{1}{3}}}$ cwt. as a decimal of a ton.

FIRST YEAR SESSIONAL EXAMINATION.

TRIGONOMETRY AND ALGEBRA.

TUESDAY, APRIL 10TH:—MORNING, 9 TO 12.

A.

1. Express all the other trigonometrical ratios of A in terms of $\cos A$.

2. Prove the following:

(*a*) $\sin (180 - A) = \sin A$.

(*b*) $\sin (180 + A) = -\sin A$.

(*c*) In any triangle $\dfrac{a+b}{a-b} = \dfrac{\tan \frac{A+B}{2}}{\tan \frac{A-B}{2}}$

(*d*) $\dfrac{\tan A + \tan B}{\tan A - \tan B} = \dfrac{\sin (A+B)}{\sin (A-B)}$

(*e*) $\cos 2A = 2 \sin^2 A - 1$.

3. Define a Logarithm.

State and prove the four propositions upon which the use of Logarithms is based.

4. A and B are two positions on opposite sides of a mountain, C is a point from which both A and B are visible; $A\,C$ and $B\,C$ are 10 miles and 8 miles respectively, and the angle $A\,C\,B$ is 60° 40′. Find the distance between A and B.

5. (*a*) Find the value of

$$4\sqrt{63} + 6\sqrt{7} - 8\sqrt{28}.$$

(*b*) Rationalize the denominator of

$$\frac{2\sqrt{3} + 3\sqrt{2}}{5 + 2\sqrt{6}}$$

(*c*) Solve the equation

$$\sqrt{x-4} + 3 = \sqrt{x+11}.$$

6. Two digits, which form a number, change places when 18 is added to the number, and the sum of the two numbers thus formed is 44: find the digits.

B.

7. Trace the changes of sign in the tangent of an angle as the angle increases from 0° to 360°.

8. Prove the following relations:—

(*a*) $\sin(A-B) = \sin A \cos B - \cos A \sin B$.

(*b*) $\tan(A-B) = \dfrac{\tan A - \tan B}{1 - \tan A \tan B}$.

(*c*) In any triangle $\cos\dfrac{A}{2} = \sqrt{\dfrac{s(s-a)}{b\,c}}$

(*d*) In any triangle $\dfrac{a+b}{c} = \dfrac{\cos\frac{A-B}{2}}{\cos\frac{A+B}{2}}$

(*e*) $\sin(45+A) - \sin(45-A) = \sqrt{2}\sin A$.

9. In a triangle $a = 1500$, $b = 1617$, $c = 815$; find A, B and C.

10. A base line $A\,B$ 1000 feet long is measured along the bank of a river; C is an object on the opposite bank; the angles $C\,A\,B$ and $C\,B\,A$ are observed to be 65° 37′ and 53° 4′ respectively; prove thus the perpendicular breadth of the river at C is 829.87 feet.

11. Solve the equations :—

(1) $\frac{a}{b\,x} + \frac{b}{a\,x} = a^2 - b^2.$

(2) $\frac{5\,x}{x-4} - \frac{3\,x-2}{2\,x-3} = 2.$

(3) $2x^2 + 3y^2 = 5$
$2x + 3y = -1.$

12. Show that $\frac{(x-a)}{x-b} + \frac{x-b}{x-a} - \frac{(a-b)^2}{(x-a)\,(x-b)} = 2$

and that $1 + \left(\frac{a^2+b^2-c^2}{2\,a\,b}\right)^2 = \frac{(a+b+c)\,(a+b-c)\,(a+c-b)}{4a^2\,b^2}$.

INTERMEDIATE EXAMINATION.

SPHERICAL TRIGONOMETRY—ALGEBRA.

MONDAY, APRIL 9TH :—MORNING, 9 TO 12.

(Write the answers in separate books marked A and B respectively to correspond to the questions.)

A.

1. Define a spherical triangle. Prove that :

(*a*) Two sides of a spherical triangle are greater than the third.

(*b*) The three angles of a spherical triangle are together greater than two right angles.

2. In a spherical triangle prove $\cos a = \cos A \sin b \sin c + \cos b \cos c$.

3. State Napier's rules for the solution of right-angled triangles.

4. Change the number 23789 to the scale of 8.

5. Find the present value of an annuity of $400 a year for 25 years, reckoning interest at 4 per cent. per annum.

6. The sum of three numbers in geometrical progression is 63, and the third term is double the second, find the numbers.

B.

7. Prove that the arithmetic, geometric and harmonic mean between a, b, and c are in geometrical progression.

Insert 4 harmonic means between $\frac{2}{3}$ and $\frac{2}{13}$.

8. Expand to four terms $(4a - 8x)^{-\frac{1}{2}}$.

Write down and simplify the 11^{th} term of $(1 - 2x_3)^{\frac{11}{2}}$

Find the greatest term in the expansion of $(3a + 2x)$; when $x = \frac{5}{2}$.

9. Find the number of combinations of n things taken r at a time.

In a town council there are 25 councillors and 10 aldermen; how many committees can be formed, each consisting of 5 councillors and 3 aldermen?

10. In a right-angled spherical triangle prove

$$\cos A = \frac{\tan b}{\tan c}, \text{ assuming } C = 90°$$

$$\sin A = \frac{\sin a}{\sin c}$$

11. In any spherical tringle prove

$$(1) \cos \frac{A}{2} = \sqrt{\frac{\sin s \sin (s-c)}{\sin b \sin c}}$$

$$(2) \sin \frac{A}{2} = \sqrt{\frac{\sin (s-b) \sin (s-c)}{\sin b \sin c}}$$

12. In a right-angled spherical triangle

$A = 52.\ 26$

$B = 49.\ 15$

Find c

Write down the equations that would lead to the solution for (a) and (b).

INTERMEDIATE EXAMINATION.

CONIC SECTIONS—SOLID GEOMETRY—ELEMENTARY DYNAMICS.

TUESDAY, APRIL 10TH:—MORNING, 9 TO 12.

(Write the answers in separate books marked A, B and C respectively to correspond to the questions.)

A.

1. In a parabola. If QV be the ordinate to the diameter PV, prove that $QV^2 = 4\ FP\ PV$, where F is the focus and P the point of intersection of the diameter with the parabola.

2. In an ellipse prove that the ratio of the distances of every point on the curve from a fixed point and a fixed straight line in its plane is constant.

3. If two straight lines be cut by three parallel planes they will be cut proportionally.

4. Three planes meet in a point, thus forming an angle in each plane; prove that any two of the angles are together greater than the third.

B.

5. The angle which a straight line makes with its projection on a plane is less than that which it makes with any other straight line that meets it in that plane.

6. If two straight lines meeting one another are respectively parallel to two other straight lines meeting one another, they will include equal angles.

7. In a parabola a diameter bisects all chords parallel to the tangent at its extremity.

8. The area of a parabola cut off by any chord is two-thirds of the area of the triangle formed by the chord and the tangents to the parabola at its extremities.

C.—DYNAMICS.

One Hour.

1. Find expressions for the time of flight and the horizontal range of a body projected with given velocity in a given direction.

Briefly describe Morin's Machine, and explain how to determine accurately the position of the axis of the curve obtained.

2. Two balls, of given masses and with given velocities, impinge directly. Write down equations to determine their subsequent velocities, pointing out clearly whence each equation is derived.

A ball of mass 2 lbs. moving 4 feet per second *meets* a ball of mass 1 lb. moving 2 feet per second. After impact the latter is found to be moving 4 feet per second. Find the coefficient of elasticity.

3. Explain the terms, *Simple Equivalent Pendulum, Centre of Oscillation, Centre of Percussion.*

How is the value of g determined by Kater's method? Point out the advantages of this method over that of the simple pendulum.

4. Shew that the energy of a body, whose moment of inertia is K, and angular velocity w is $\frac{1}{2} Kw^2$.

A fly-wheel, whose mass of 3 tons may be regarded as entirely in the circumference, has a radius of 5 feet and is making one turn in 2 seconds. How far can it wind up a mass of 1 cwt. hanging by a rope coiled on the circumference before coming to rest?

THIRD YEAR SESSIONAL EXAMINATION.

MECHANICS AND HYDROSTATICS.

TUESDAY, APRIL 3:—MORNING, 9 TO 12.

1. Four forces of 4, 6, $6\sqrt{3}$, $4\sqrt{3}$ lbs. weight make angles of 120°, 30°, 150°, 60°, at a point. Take the line of action of 4 to lie between the 60° and 120° angles, and the angles and forces to be numbered to the left. Find the magnitude and direction of the resultant.

2. A uniform rod AB, of weight 16 lbs. and length 10 feet, is hinged by its upper end A to a fixed point, and rests in a position inclined at 60° to the horizontal, being acted on by a horizontal force F applied at the lower end B. Find the magnitude of F and the reaction at the hinge.

3. State and deduce the general formula for the determination of the centre of gravity.

Four uniform spheres of radii 3, 4, 6, 8 inches respectively are fastened together side by side. What is the distance of the centre of gravity of the combination from the outer edge of the largest sphere?

4. Show how to find the ratio of the power to the weight in the system of pulleys in which each string is attached to the supporting beam, neglecting the weight of the pulleys.

A man of weight 168 lbs. is suspended from the lowest of the above systems of pulleys, there being 4 pulleys. If he support himself by pulling on the end of the string, which passes over a fixed pulley, how much of his weight will come on the system of pulleys.

5. Define Coefficient of Friction, limiting Friction. State briefly what you know about the laws of Friction.

A weight of 30 lbs. will just rest on a rough inclined plane whose inclination to the horizontal is $\sin^{-1}\frac{3}{5}$. Show that it will require a force of 36 lbs. weight acting parallel to the plane to be just at the point of moving the body up the plane.

6. Given the initial velocity and the acceleration of a body, show how to find (1) the velocity at the end of any time t, (2) the space described in the time t.

Given that a body falling freely passes through 176.99 feet in the sixth second, find the value of g.

7. State the law of motion from which we derive our method of measuring force. What is the unit of force? Why is the weight of one pound not a suitable unit?

A train runs from rest for 1 mile down an incline of 1 in 100. If the resistance due to friction be 8 lbs. per ton, how far will the train be carried along the horizontal level at the foot of the incline.

8. A glass ball whose mass is $\frac{1}{8}$ lb. falls from a height of 25 feet and rebounds to a height of 16 feet. What is the average force exerted on the ball if the contact lasts for $\frac{1}{50}$ sec ?

9. Explain the action and theory of the hydrostatic press.

10. Show that the upward pressure on a body immersed in a liquid is equal to the weight of liquid displaced by the body.

11. Describe briefly three ways of finding the specific gravity of a solid body which will sink in water.

A solid which will float in water weighs 4 lbs.; when the solid is attached to a heavy piece of metal, the whole weighs 6 lbs. in water, the weight of the metal alone in water being 8 lbs. Find the specific gravity of the solid.

B.A. ORDINARY.

MECHANICS.

MONDAY, APRIL 9TH:—MORNING, 9 TO 12.

1. The sum of two forces is 18 and the resultant whose direction is perpendicular to the lesser of the two forces is 12; find the magnitude of the forces.

2. Find the magnitude and position of the resultant of two parallel forces acting on a body, in the same direction.

3. The axle of a capstan is 16 inches in diameter and there are 8 bars. At what distance from the axis must 8 men push, one at each bar and each exerting a force equal to the weight of $26\frac{2}{3}$ lbs., in order to raise the weigh of one ton.

4. A rod AB, 2 feet in length and of weight 5 lbs., is trisected in the points C and D, and at the points A, C, D, B are placed particles of 1, 2, 3, 4 lbs. weight respectively; find the centre of gravity of the system.

5. A body of weight 4 lbs. rests in limiting equilibrum on a rough plane whose slope is 30°; the plane being raised to a slope of 60°, find the force aloug the plane required to support the body.

6. A horse of weight 1000 lbs. walks on a treadmill inclined at an angle of 30° at the rate of 2 miles per hour. If 50 % of the work done by the horse is spent in overcoming the friction of the mill, what effective horse power can be obtained from the mill?

7. An Atlantic liner of mass 15,000 tons and travelling at the rate of 20 miles per hour requires to be brought to rest in a distance of 100 feet to avoid a collision. Neglecting the effect of the friction of the water, what average retarding force in tons will have to be exerted?

8. If a body be projected at an angle θ, with an initial velocity ω, find the time of flight and the horizontal range.

A hunter fires horizontally with a rifle, the sights being parallel to the barrel, at a monkey hanging from a tree. The monkey lets go when he sees the flash; will the shot strike him? Why?

9. Define: a perfectly rigid body, a perfect liquid, a perfect gas, a viscous fluid.

On what does the action of the Bramah press depend? Would the press work if a gas instead of a liquid were used?

10. A hollow cone of height h and radius of base r rests on a table with its base horizontal, and is filled with a liquid. Show that the total pressure of the liquid on the base is three times the weight of the liquid contained in the cone.

$$\text{Volume of cone} = \tfrac{1}{3}\,\pi\, r^2\, h.$$

11. A ship of mass 1,000 tons goes from fresh water to salt water. If the area of the section of the ship at the water line be 15,000 square feet and her sides vertical where they cut the water, find how much the ship will rise taking the specific gravity of sea water to be 1.026.

12. Assuming the height of the water barometer to be 34 feet, find to what depth an inverted tumbler must be submerged so that the volume of the air inside may be reduced to one-third its original volume.

FIRST YEAR (ADVANCED SECTION).

GEOMETRY (*First Paper*).

WEDNESDAY, APRIL 18TH:—MORNING, 9 TO 12.

A.

1. If two opposite sides of a quadrilateral be produced to meet in P, and if G, H, be the middle points of the diagonals of the quadrilateral, the triangle $P\,G\,H$ is equal to one-fourth of the quadrilateral

2. Given n right lines in magnitude and position, and the sum of the areas of the n triangles formed by joining any point P to the ends of these lines as bases, prove that the locus of P is a right line.

3. If the base AB of a triangle be divided in D so that $m\,AD = n\,DB$, then

$$m\,AC^2 + n\,BC^2 = m\,AD^2 + n\,BD^2 + (m+n)\,CD^2.$$

4. Given the lengths of the bisectors of the three sides of a triangle, construct it.

5. Find a point such that the feet of the four perpendiculars let fall from it on the sides of a given quadrilateral shall be collinear.

6. Define the "nine-points circle" of a triangle and prove its fundamental property.

B.

7. The rectangle contained by the perpendicular from any point O in the circumference of a circle on two tangents AC, BC, is equal to the square of the perpendicular from the same point on their chord of contact.

8. Three times the sum of the squares of the sides of a triangle is equal to four times the sum of the squares of the lines bisecting the sides of the triangle.

9. The difference between the squares of the tangent from any point P to two circles, is equal to twice the rectangle contained by the perpendicular from P on the radical axis and the distance between the centres of the circles.

10. In any triangle, the rectangle contained by two sides is equal to the rectangle contained by the perpendicular on the third side and the diameter of the circumscribing circle.

11. If four collinear points form a harmonic system, their four polars with respect to any circle form a harmonic pencil.

FIRST YEAR (ADVANCED SECTION).

GEOMETRY (*Second Paper.*)

WEDNESDAY, APRIL 18TH:—AFTERNOON, 2 TO 5.

A.

1. If two of the vertices of a variable triangle move on fixed right lines, and if the three sides pass through three fixed collinear points, the locus of the third vertex is a right line.

2. Define the "inverse" of a circle, and prove that it is either a line or a circle, according as the centre of inversion is on the circumference of the circle or not on the circumference.

3. If through a centre of similitude of two circles, a secant be drawn cutting one of them in the points R, R', and the other in the corresponding points S, S'; then the $OR.OS'$, $OR'.OS$ are constant and equal.

4. If two circles touch two others, the radical axis of either pair passes through a centre of similitude of the other pair.

5. Given the base, the vertical angle, and the bisector of the vertical angle of a triangle, construct the triangle.

6. Given three co-axal circles, the tangents drawn from any point of one of them to the other two, are in a given ratio.

B.

7. Any line cutting a circle and passing through a fixed point is cut harmonically by the circle, the point, and the polar of the point.

8. Any two circles can be inverted into themselves.

9. If two equal pencils have a common ray, the intersections of the remaining three homologous pairs of rays are collinear.

10. If from a point without a circle four secants be drawn, four of the points when they cut the circle shall have the same anharmonic ratio as the other four points.

11. State and prove Pascal's Theorem.

12. Each of the diagonals of a complete quadrilateral is cut harmonically by the other two.

FIRST YEAR (ADVANCED SECTION).

THEORY OF EQUATIONS—ALGEBRA.

THURSDAY, APRIL 19TH:—MORNING, 9 TO 1.

A.

1. Expand $\sqrt{1-x}$ to four terms by the method of Indeterminate Coefficients.

2. Resolve $\frac{23x - 11x^2}{(2x - 1)(9 - x^2)}$ into partial fractions.

3. Expand a_x in ascending powers of x.

4. Find the equation whose roots are the squares of the roots of the equation

$$ax^3 + bx^2 + cx + d = 0.$$

5. Find the three cube roots of unity.

6. If a, b, c, etc., are the roots of the equation $f(x) = 0$, prove

$$f'(x) + \frac{f(x)}{x - a} + \frac{f(x)}{x - b} + \frac{f(x)}{x - c} \text{ etc.}$$

B.

7. Solve the equation $x^3 + px + r = 0$.

8. Solve the equation $x^5 - 1 = 0$.

9. The positive root of the equation $4x^3 - 13x^2 - 31x - 275 = 0$, lies between 6 and 7; find it by Horner's method.

10. If in any equation each negative coefficient be taken positively and divided by the sum of all the positive coefficients which precede it, the greatest quotient thus formed, increased by Unity, is a superior limit of the positive roots.

11. How many permutations can be made with the letters of the word *triangle*? How many of these begin with *t* and end with *e*.

12. Expand $\left(\frac{2}{3}x - \frac{3}{2x}\right)^6$, and find the coefficient of x^1 $m\left\{x^2\left(1 + \frac{3a}{x\,3}\right)\right\}^{15}$.

SECOND YEAR (ADVANCED SECTION).

ANALYTIC GEOMETRY (*First Paper*).

WEDNESDAY, APRIL 18TH:—MORNING, 9 TO 12.

1. Show that the equation of the chord of a circle may be put into the form

$$x \cos \tfrac{1}{2}(\theta' + \theta'') + y \sin \tfrac{1}{2}(\theta' + \theta'') = r \cos \tfrac{1}{2}(\theta' - \theta'')$$

where θ' and θ'' are the angles which radii drawn to the extremities of the chord make with the axis of x.

2. Through the intersection of two circles a right line is drawn; find the locus of the middle point of the portion intercepted between the circles.

3. Find the equation of the circle through the origin and through the points $x' y'$; $x'' y''$.

4. Find the condition that $ax + by + c = 0$ should touch the circle
$$(x - h)^2 + (y - k)^2 = r^2.$$

5. Find the lines represented by the equations
(*a*) $x^2 - 5xy + 4y^2 + x + 2y - 2 = 0$
(*b*) $x^2 - 2xy \tan\theta - y^2 = 0.$

6. Given the angles of a triangle; one vertex is fixed, another moves along a fixed right line; find the locus of the third.

7. Given the vertical angle of a triangle, find the locus of the point where the base is cut in a given ratio, if the area also is given.

8. A line is drawn parallel to the base of a triangle, and its extremities joined transversely to those of the base; find the locus of the point of intersection of the joining lines.

9. The three bisectors of the angles of a triangle meet in a point.

10. Find the equation of the line joining the origin to the point of intersection of the lines $2x + 5y = 10$; $4x + y = 4$.

11. Find the equation of the right line passing through a given point and perpendicular to a given line.

12. Prove that if the middle point of the sides of a quadrilateral be joined in consecutive order, the figure thus made is a parallelogram.

SECOND YEAR (ADVANCED SECTION.)

ANALYTIC GEOMETRY (*Second Paper.*)

THURSDAY, APRIL 19TH :—MORNING, 9 TO 12.

1. Through any point can be drawn two right lines, real, coincident or imaginary, which will meet a given conic on only one point at a finite distance from the origin.

2. Find the locus of the middle points of all chords of a conic, given by the general equation, parallel to $y = mx$.

(*a*) Apply this to the curve $xy = 16$.

3. For all conics, the squares of the ordinates of any diameter are proportional to the rectangles under the segments which they make on the diameter.

4. Defining a conic section geometrically with regard to the focus and directrix, deduce the simplest form of its equation referred to the centre as origin with rectangular axes when e is less than 1.

5. Show that there is an infinite number of systems of oblique axes for which the form of the equation will be the same as in 4.

6. The perpendicular from the focus of an hyperbola on the asymptotes is equal to the conjugate semi-axis b.

7. The rectangle under the segments of the normal at any point of an ellipse is equal to the square of the conjugate semi-diameter.

8. If any line cut an hyperbola, the portions intercepted between the curve and its asymptotes are equal.

9. The point where any tangent to a parabola cuts the axis and its point of contact are equally distant from the focus.

10. Given the base of a triangle and the product of the tangents of the halves of the base angles, find the locus of the vertex.

11. Find the equation of the circle touching the conic,

$$ax^2 + 2hxy + by^2 + 2n = 0$$

in three consecutive points at the origin.

12. The rectangle under the segments of a focal chord of an ellipse is proportional to the whole chord.

SECOND YEAR (ADVANCED SECTION).

PLANE AND SPHERICAL TRIGONOMETRY.

FRIDAY, APRIL 20TH :—AFTERNOON, 2 TO 5.

1. State Demoivre's theorem and prove it for a *negative* integer.

2. Prove that

$$\log_e \frac{m}{n} = 2\left\{\frac{m-n}{m+n} + \frac{1}{3}\left(\frac{m-n}{m+n}\right)^3 + \text{etc.}\right.$$

3. Calculate the value of π to three decimal places by the aid of Machin's series.

4. Prove that the solid angle subtended at any point by an infinite plane is 2π.

5. Show that the arc drawn through the poles of two great circles cuts both at right angles.

6. In any spherical triangle

$$\cot a \sin b = \cot A \sin C + \cos b \cos C.$$

7. In a spherical triangle

$A = 31° 34' 26''$, $B = 30° 28' 12''$, $c = 70° 2' 3''$, find a.

8. In a right-angled spherical triangle given

$A = 52° 26'$; $B = 49° 15'$, find c.

SECOND YEAR (Advanced Section).

DIFFERENTIAL AND INTEGRAL CALCULUS.

Friday, April 29th :—Morning, 9 to 12.

1. If $y = f(x)$ represent a curve, prove that $f'(x)$ is the trigonometrical tangent of the angle which the line touching the curve at the point (x, y) makes with the axis of x.

(*a*) Find hence the equation of the tangent at the point (2, 1,) to the curve $x^2 = 4y$.

2. Prove that if a function be equal to the algebraic sum of a number of functions, its derived function is the sum of the derived functions of its several parts taken with their proper signs.

3. If $u = z^4$ where $z = a + b x^3$, prove that

$$\frac{du}{dx} = \frac{du}{dz} \times \frac{dz}{dx}$$

and apply this formula.

4. Differentiate

$$\sin^{-1}(x^n) \; ; \; \sin(\sin x) ;$$

$$\tan^{-1} \frac{\sqrt{1+x^2} + \sqrt{1-x^2}}{\sqrt{1+x^2} - \sqrt{1-x^2}} ; \log \sqrt{\frac{a\cos x - b \sin x}{a \cos x + b \sin x}}$$

5. If $y = \sin m x$, find $\frac{d^{2n} y}{dx^{2n}}$ and $\frac{d^{2n+1} y}{dx^{2n+1}}$.

6. If $y = r^x \sin x$, prove $\frac{d^n y}{dx^n} = \frac{r^x \sin (x + n A)}{\sin^n A}$

where $\tan A = \frac{1}{n}$.

7. Expand $\log (x + y)$ by Taylor's Theorem.

8. Prove MacLaurin's Theorem, and apply it to the expansion of a^x in a series.

9. Find by integration the area of a circle.

10. Integrate the following:—

$$\int \sin m x \sin n x \, dx; \quad \int \frac{dx}{\sqrt{x^2 - a^2}}; \quad \int \frac{dx}{x (a + b x^n)}$$

11. Integrate $\int \frac{d\theta}{a + b \cos}$.

12. Classify the usual methods of reduction of the integration of functions to one of the fundamental formulae and give an example of each.

HONOUR MATHEMATICS AND NATURAL PHILOSOPHY.

THIRD YEAR HONOURS.

STATICS.

FRIDAY, APRIL 20TH :—MORNING, 9 TO 12.

1. Deduce the parallelogram of forces from Newton's Laws of Motion.

$A\,B\,C\,D\,E\,F$ is a regular hexagon ; and at A forces act, represented in magnitude and direction by AB, $2\,AC$, $3\,AD$, $4\,AE$, $5\,AF$. Shew that the length of the line representing their resultant is $\sqrt{351}\,.\,AB$.

2. Shew how to reduce any system of forces in one plane to a single force and a couple ; and deduce the conditions of equilibrium.

3. Find the centre of gravity of a hemisphere.

Two equal solid smooth hemispheres, placed so as to look like one sphere with the diametral plane vertical, rest on two pegs which are on the same horizontal line. Prove that the least distance apart of the pegs, so that the hemispheres may not fall asunder, is to the diameter of the sphere as 3 is to $\sqrt{73}$.

4. Explain the Principle of Virtual Work. Three equal uniform rods are freely jointed at their ends and rest over two smooth pegs, in a horizontal line, at a distance apart equal to half the length of a rod. If the lowest side be horizontal, the reaction at the upper joint is $\frac{5}{18}\sqrt{3}\,.\,\omega$, where ω is the aggregate weight of the rods.

5. State the Laws of Friction.

A right cone, of weight ω and angle 2α, is placed in a circular hole, cut in a horizontal table, with its vertex downwards. Shew that the least couple which will move it is $\mu\,\omega\,r\,\operatorname{cosec}\alpha$, where r is the radius of the hole.

6. The co-ordinates of the centre of gravity of an arc of the catenary

$$y = \frac{c}{2}\left(e^{\frac{x}{c}} + e^{-\frac{x}{c}}\right),$$

from $x = 0$ to $x = x$, are

$$\bar{x} = x - \frac{c\,(y-c)}{s}; \quad \bar{y} = \tfrac{1}{2}\left(y + \frac{c\,x}{s}\right).$$

7. Find the equation to the catenary.

A uniform measuring chain of length l is stretched across a river tightly, the middle point just touching the water, while each end has an elevation k above it. Shew that the difference between the length of the measuring chain and the breadth of the river is nearly $\frac{8}{3}\frac{k^2}{l}$.

8. A rough string without weight rests on a curve. Find the differential equation for the tension.

A light string passes over two small rough pegs in the same horizontal plane distant $2b$ from each other. Find the least weights, P, P, which hung to the ends of the string will support a weight ω placed at the middle point at a depth b below the pegs. If $3\pi\mu = 2\log 2$, show that $2P = \omega$.

HONOURS IN MATHEMATICS AND NATURAL PHILOSOPHY.

THIRD AND FOURTH YEAR HONOURS.

WEDNESDAY, APRIL 18TH:—MORNING, 9 TO 12.

SURFACES.

1. Find the surface of revolution generated by a right line turning round a fixed axis which it does not intersect.

2. When two surfaces have stationary contact they touch in two consecutive points.

3. Find the partial differential equation of conical surfaces.

4. The sum of the squares of the projections of three conjugate diameter of a quadric on any fixed line is constant.

5. Find the radius of curvature of any normal section of a surface meeting the tangent plane in a line whose direction angles are given.

6. The axes of any tangent cone to a quadric are the normals to the three confocals which can be drawn through the vertex of the cone.

7. Two confocal surfaces cut each other everywhere at right angles.

8. Find the condition that the general equation of the second degree should represent a cone.

9. Find the condition that the plane $ax + \beta y + \gamma z + \delta w$ should touch the surface given by the general equation of the second degree.

10. Find the condition that the plane $ax + \beta y + \gamma z \times \delta = 0$ should touch $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z_2}{c^2} = 1$

11. Fine the equation of a plane drawn through a given line perpendicular to a given plane.

12. Fine the equation of a plane through the two intersecting lines

$$\frac{X - X_1}{\cos \alpha} = \frac{Y - Y_1}{\cos \beta} = \frac{Z - Z_1}{\cos \gamma}$$

$$\frac{X - X_1}{\cos \alpha_1} = \frac{Y - Y_1}{\cos \beta_1} = \frac{Z - Z_1}{\cos \gamma_1}$$

HONOURS IN MATHEMATICS AND NATURAL PHILOSOPHY.

THIRD AND FOURTH YEARS.

DYNAMICS.

FRIDAY, APRIL 6TH :—MORNING, 9 TO 12.

1. Find expressions for the accelerations of a particle along and perpendicular to the radius vector.

A particle P describes a circle, on diameter AB, so that the angular velocity of AP about A is constant and equal to ω. Find the acceleration towards A, and prove that the motion in AP is Simple Harmonic. What is its period ?

2. The velocity of a stream varies as the distance from the nearest bank. Shew that a man attempting to swim directly across will describe two semi-parabolas. (Shew that the subnormal is constant.)

3. If g is the acceleration due to the earth at distance R from the centre, shew that a meteorite attracted from an infinite distance along

a straight path to the earth would reach it with velocity V, such that $V^2 = 2gR$.

4. Shew that the time of quickest descent down a focal chord of a parabola whose axis is vertical is $\sqrt{3\sqrt{3} \cdot \frac{l}{g}}$ where l is the latus rectum.

5. Find expressions for the Range and Time of Flight of a Projectile.

If the focus of the projectile's path be as much below the horizontal plane through the point of projection as the vertex is above, shew that the angle of projection $= \frac{1}{2} \sec^{-1} 3$.

6. Prove the formula $v^2 = \mu \left(\frac{2}{r} - \frac{1}{a}\right)$ for a particle describing an ellipse about a focus.

A body is describing a circle radius a under a force, varying inversely as the square of the distance towards the centre. Suddenly the centre of force is shifted to the middle point of the radius passing through the body at that instant. Find the axes of the new orbit, and shew that the eccentricity will be $\frac{1}{2}$.

7. A body is projected with a velocity of 100 feet per minute from a point whose distance from a centre of force (which varies inversely as the square of the distance) is 32 feet, the velocity in a circle at that distance being 80 feet per minute ; find the periodic time.

8. A second's pendulum is lengthened $\frac{1}{10}^{th}$ of an inch ; shew that if $g = 32.19$, it will lose 110.4 seconds a day.

9. A ball for which $e = \frac{1}{2}$ is to be thrown against a smooth vertical wall distant 10 feet, so as to return to the point of projection. Find the least velocity that will suffice, and the direction of projection.

HONOURS IN MATHEMATICS AND NATURAL PHILOSOPHY.

THIRD AND FOURTH YEARS.

LIGHT.

MONDAY, APRIL 16TH :—AFTERNOON, 2 TO 5.

1. A ray of light falls at an angle of 60° on a sphere whose index of refraction is $\sqrt{3}$, and emerges after one internal reflection. Show that its direction on emergence is parallel to its original direction.

2. A luminous point is placed on the axis of a hemispherical lens of radius R, at a distance d, in front of the plane surface. If the image formed by reflection at this surface coincides with that formed by refraction at the plane and reflection at the spherical surface, shew that the index of refraction of the glass is $\frac{R}{R-2d}$

3. Show that for minimum deviation a ray must pass through a prism symmetrically.

4. Two lenses, of focal lengths f_1, f_2, are placed on the same axis at a distance a; find an expression for the focal length of the combination.

Describe Ramsden's and Huyghens' eyepieces, and mention the advantages of each.

5. A ray travels in a medium whose refractive index is proportional to its distance from a fixed plane. Obtain the differential equation to its path and integrate it, so as to find the nature of the curve.

6. Explain a method for calculating the intensity of illumination produced at any point of a plane area by a bright surface of given form.

A slit of height h and breadth b, and intrinsic brightness c, illuminates a small area whose plane is perpendicular to the slit and passes through the foot of it. Find the brightness of the area, when it is distant d from the slit.

(For Third Year only.)

7. Calculate the formula for the aberration for the case of a pencil incident directly on a spherical refracting surface.

8. Explain the formation of focal lines when a pencil falls obliquely on a spherical mirror. Determine the distance of the Primary Focal Line from the mirror.

9. Find the breadth of the Field of View *by half pencils* in the Astronomical Telescope.

10. Account for the formation of a Primary Rainbow.

(For Fourth Year only.)

7. A particle is subject simultaneously to two vibrations of the same period in directions at right angles, of amplitudes a and b and difference of phase δ. Find the resultant motion, and discuss the case when δ is on-quarter of a period.

8. Show how to connect the amplitudes of the reflected and refracted rays with that of the incident ray, when the densities of the two media are ρ and ρ^1. What hypotheses were made by Fresnel and McCullagh, respectively?

9. State Gladstone and Dale's law for the variation of refractive index with density. Give a physical interpretation of it. What modification must be made for the emission theory?

10. Describe in detail the method of determining the wave-length of sodium light by means of the Optical Bench and Fresnel's Biprism. Prove the formulae for the wave-length and for the distance between the two images of the slit.

11. Give the theory of a Rowland Concave Grating, and describe the mounting.

12. State clearly the assumptions made by Fresnel in his theory of double refraction, and obtain in any manner the equation to the wave surface.

B.A. HONOURS IN MATHEMATICS AND PHYSICS.

ELECTRICITY AND MAGNETISM.

MONDAY, APRIL 2ND:—AFTERNOON, 2 TO 4.30.

1. Describe the construction of a Thomson Absolute electrometer. Show how from constants of the apparatus and the force on the attracted disc, the potential of a conductor can be determined in absolute measure.

2. A point charge e is placed at P, a distance f, from the centre of a metal sphere radius a kept at zero potential. Prove that the surface density of electrification at a point S on the sphere is equal to

$$\frac{e\,a}{4\,\pi\,PS^3}\left(1-\frac{f^2}{a^2}\right).$$

3. If M is the moment of an electric doublet and O its centre, prove that the electric intensity at a point P is equal to

$$\frac{M\sin\theta}{O\,P^3} \text{ perpendicular to } O\,P$$

$$\text{and } \frac{2\,M\cos\theta}{O\,P^3} \text{ along } O\,P.$$

where θ is the angle the axis of the doublet makes with $O\,P$.

Deduce the distribution of electricity on the surface of an insulated conducting sphere placed in a uniform electric field.

4. Explain Gauss' proof that the force between two magnetic poles varies inversely as the square of the distance between them.

5. Prove that the work done in carrying unit magnetic pole round a circuit conveying a current i is equal to $4\pi i$.

Deduce the magnetic force at the centre of a solenoid length l, n turns, for a current of i amperes.

6. Prove that the current i at any time t after an $E\,M\,F$ E has been applied to a circuit of resistance R and self-inductance L is given by

$$i = \frac{E}{R}\left(1 - e^{-\frac{R.t}{L}}\right).$$

Prove that the energy stored up in the magnetic field is equal to $\frac{1}{2} L i^2$.

A battery is placed in series with a solenoid 1 metre long, 10 turns per cm and diameter 4 cms. Find the time taken for the current to rise to half its value, the resistance of the circuit being 10 ohms.

7. Find the value of the current flowing through a circuit containing resistance and self inductance when an alternating $E\,M\,F$ is applied to its terminals. Find the angle of lag.

Show that for rapid oscillations the distribution of the current in multiple circuits is approximately independent of the resistances.

B.A. HONOURS IN MATHEMATICS AND NATURAL PHILOSOPHY.

ASTRONOMY.

TUESDAY, APRIL 10TH:—AFTERNOON, 2 TO 5.

1. Prove the formula for finding the latitude of a place by observations of the Pole Star at any hour of the day, viz.:

$$l = a - p\cos h + \tfrac{1}{2}\sin 1''\,(p\sin h)^2 \tan a$$

where a = true altitude of the star

p = apparent polar distance expressed in seconds of arc.

h = the hour angle of the star.

2. If l be the astronomical latitude of a place on the Earth's surface, and l^1 the geocentric latitude prove

$$l^1 = l - \frac{a^2 - b^2}{a^2 + b^2}\sin 2l + \tfrac{1}{2}\left(\frac{a^2 - b^2}{a^2 + b^2}\right)^2 \sin 4l, \text{ etc.}$$

3. Assuming that 365.24222 mean solar days are equal to 366.24222 sidereal days, prove that
one sidereal day = a mean solar day minus $3^m\ 55^s.909$ mean solar time.

Express the sidereal interval $10^h\ 8^m\ 40^s$ in mean time.

4. Investigate a formula for finding when the Sun is due East on a given day at a given place.

5. Investigate a method for determining the coefficient of refraction from observations of a circumpolar star.

6. Find a formula for determining the aberration of a given star in Right Ascension.

7. Find when the equation of time caused by the unequal motion in the ecliptic is additive or subtractive.

8. Explain, with the aid of diagrams, the changes that would take place in the climate of Montreal on the following suppositions:—

(*a*) If the axis of the Earth were perpendicular to the plane of the Ecliptic.

(*b*) If the axis were in the plane of the Ecliptic.

9. If the observed altitude of the Sun's upper limb be 28° 21′ 24″ find its true altitude, allowing for parallax and refraction.

10. In latitude 48° 51′ N., the Sun's declination was 18° 30′ N., and its altitude 52° 35′, find its azimuth.

B.A. HONOURS IN MATHEMATICS AND NATURAL PHILOSOPHY.

LUNAR THEORY—NEWTON'S PRINCIPIA.

WEDNESDAY, APRIL 11TH:—AFTERNOON, 2 TO 5.

1. Find the differential equation of the Moon's radius vector

$$\frac{du^2}{d\theta^2} + u = \frac{\dfrac{P}{h^2 u^2} - \dfrac{T}{h^3 u^2}\dfrac{du}{d\theta}}{1 + 2\displaystyle\int \frac{T}{h^2 u^3}\, d\theta}$$

2. Give a geometrical construction for the disturbing force of the Sun on the Moon.

When is the disturbing force altogether radial?

When altogether tangential?

3. From the construction in question 2 find the values of P and T in question 1.

4. Prove that the mean central disturbing force is ablatitious.

5. Show that the lunar months must be longer in winter than in summer on account of the disturbing force.

6. In the expression for the Moon's longitude, find the physical meaning of the term

$$\frac{11}{8}\ m^2 \sin \left\{ (2 - 2m)\ pt - 2\beta \right\}$$

7. From the expression

$$s = k\ (g\ \theta - \gamma)$$

find approximately in days the period of revolution of the Moon's nodes, assuming $g = 1 + \frac{3}{4}\ m^2 . - \frac{9}{32}\ m^3$

8. In the expansion of $\frac{T}{h^2\ u^3}$ the term

$$-\frac{15}{4}\ m^2\ e^2 \sin \left\{ (2 - 2\ m - c)\ \theta - 2\ \beta + 2\ a \right\}$$

is retained, although of the fourth order; explain why.

9. Prove that the Moon's orbit is everywhere concave to the Sun.

10. A body moves in a parabola about a centre of force in the focus, the law of the force in Newton's manner.

B.A. HONOURS IN MATHEMATICS AND NATURAL PHILOSOPHY.

DIFFERENTIAL EQUATIONS.

FRIDAY, APRIL 20TH:—MORNING, 9 TO 12.

1. Integrate the equations:—

(1) $(y^2 + x\ y^2)\ dx + (x^2 - yx^2)\ dy = 0$,

(2) $(x + y)^2\ dy = a^2\ dx$.

2. If $\frac{dy}{dx} + Py = Q$, P and Q being functions of x, show that

$$y = c\,e^{-v} + e^{-v} \int Q\,e^{v}\,dx,$$

where $v = \int P\,dx$.

Solve $(1 + x^2)\ \frac{dy}{dx} + y = \tan^{-1} x$.

3. Explain a method of integrating homogeneous equations of the first order and first degree, and apply it to the equation

$$x\,dy = (y + \sqrt{x^2 + y^2})\,dx.$$

4. Solve the equation $y = a\ \frac{dy}{dx} + \sqrt{1 + \left(\frac{dy}{dx}\right)^2}$.

5. Integrate $\left(\frac{dy}{dx}\right)^2 - 5\ \frac{dy}{dx} + 6 = 0$.

6. Explain the method of solving Clairant's equation,

$$y = px + f(p), \text{ where } p = \frac{dy}{dx}.$$

Find the primitive of $y = px + \sqrt{1 + p^2}$; also find the singular solution.

7. Solve the equations :—

(1) $\frac{d^2 y}{dx^2} - 7\ \frac{dy}{dx} + 12\,y = x$,

(2) $\frac{d^4 y}{dx^4} + 2\ \frac{d^2 y}{dx^2} + y = 0$,

(3) $\frac{d^2 y}{dx^2} + y = \cos x$.

8. Determine the condition that the equation $P\,dx + Q\,dy + R\,dz = 0$ may be derived from a single primitive.

Show that the condition is satisfied by the equation

$$(y + x)^2\,dx + z\,dy - (y + a)\,dz = 0,$$

and solve for the primitive.

9. Solve the simultaneous equations :—

$$dx = -\frac{dy}{3y + 4z} = -\frac{dz}{2y + 5z}.$$

10. Show that an equation of the second order can be depressed to one of the first when either of the primitive variables is absent from the equation.

Integrate $(1 + x^2)\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^2 + 1 = 0.$

11. Prove that the curve in which the radius of curvature is equal and opposite to the normal is the catenary.

12. Prove that the orthogonal trajectory of a system of confocal ellipses is a system of hyperboles confocal with the ellipses.

B.A. HONOURS IN MATHEMATICS AND NATURAL PHILOSOPHY.

CALCULUS.

FRIDAY, APRIL 20TH:—AFTERNOON, 2 TO 5.

1. If $u = f(x + \alpha t, y + \beta t)$, where x, y, α, β, are independent of t and of each other, prove that

$$\frac{du}{dt} = \alpha \frac{du}{dx} + \beta \frac{du}{dy}.$$

2. Prove that the pedal of the curve $r^m = a^m \cos m\theta$ is $r^n = a^n \cos n\theta$, where $n = \frac{m}{1+m}$.

3. Find the asymptotes of the following curves:—

(1) $x^4 - x^2y^2 + x^2 + y^2 = a^2$,

(2) $(r - a)\theta^2 = r$.

4. Prove that a double point (x, y) on a curve $u = c$ is a node, cusp, or conjugate point, according as

$$\frac{d^2u}{dx\,dy} \text{ is } > = \text{ or } < \frac{d^2u}{dx^2} \cdot \frac{d^2u}{dy^2}.$$

5. Investigate one of the following expressions for the radius of curvature at any point of a curve:—

$$\frac{ds^2}{\sqrt{(d^2x)^2 + (d^2y)^2 - (d^2s)^2}}, \quad \frac{\left[1 + \frac{1}{u^2}\left(\frac{du}{d\theta}\right)^2\right]^{\frac{3}{2}}}{u + \frac{d^2u}{d\theta^2}}.$$

6. Show that the co-ordinates of any point on a hypocycloid are

$$x = (a - b)\cos\theta + b\cos\left(\frac{a-b}{b}\right)\theta,$$

$$y = (a - b)\sin\theta - b\sin\left(\frac{a-b}{b}\right)\theta,$$

where a and b are the radii of the fixed and moving circles, respectively.

Investigate the cases in which (1) $a = 2b$, (2) $a = 4b$.

7. If $x = r\cos\theta$, $y = r\sin\theta$, show that for any function V,

$$\frac{d^2V}{dx^2} + \frac{d^2V}{dy^2} = \frac{d^2V}{dr^2} + \frac{1}{r}\frac{dV}{dr} + \frac{1}{r^2}\frac{d^2V}{d\theta^2}.$$

8. Show that:—

(1) $\int_0^{\frac{\pi}{2}} \frac{d\theta}{5 + 4\sin\theta} = \frac{2}{3}\tan^{-1}(\frac{1}{3})$, (3) $\int_0^{\frac{\pi}{2}} x^2\cos x\,dx = \frac{\pi^2}{4} - 2$

(2) $\int_0^{\frac{\pi}{2}} \frac{d\theta}{(1+\cos\theta)^2} = \frac{2}{3}$, (4) $\int_0^{\infty} \frac{dx}{1 + 2x\cos\phi + x^2} = \frac{\phi}{\sin\phi}$.

9. If $u = f\phi(x, a)\,dx$, and a be independent of x, prove that

$$\frac{du}{da} = \int \frac{d\phi}{da}\,dx.$$

Show that (1) $\int_0^{\infty} \frac{e^{-ax}\sin mx}{x}\,dx = \tan^{-1}\frac{m}{a}$

(2) $\int_0^{\infty} e^{-x^2}\,dx = \frac{1}{2}\sqrt{\pi}$.

10. What function is indicated by $\Gamma(m)$? Show that $\Gamma(m+1) = m\,\Gamma(m)$.

11. Find an expression for the length of a curve whose equation is given in polar co-ordinates.

Find the length of a loop of the curve $r^{\frac{1}{3}} = a^{\frac{1}{3}}\cos\frac{1}{3}\theta$.

12. A cycloid revolves about its base. Show that the volume and surface of the solid of revolution are $5\pi^2 a^3$ and $\frac{64}{3}\pi a^2$, respectively.

13. A sphere of radius a is cut by a right cylinder of radius $\frac{1}{2}a$, one of whose edges passes through the centre of the sphere. Find the volume common to the two surfaces.

14. Find the moment of inertia of an ellipsoid with regard to (1) a principal axis, (2) a principal plane.

ENGLISH LANGUAGE AND LITERATURE.

FIRST YEAR SESSIONAL EXAMINATION.

ENGLISH LITERATURE.

THURSDAY, 5TH APRIL:—MORNING, 9 TO 12.

1 Contrast the work of Bacon as an essayist with that of Burton. Account as far as possible for the characteristics of each.

2. Write briefly on the life and character of *one* of the following: Sir Thomas Browne, Abraham Cowley, Jonathan Swift.

3. Give, with dates, some account of the following: The Review, The Tatler, The Bee, The Idler.

4. Characterize very briefly the essay writing of Earle, of Dryden, of Defoe, and of Johnson.

5. Name the author and give a slight account of each of the following: Religio Medici, The Battle of the Books, Idea of a Patriot King, Citizen of the World.

6. "Nullum (genus) quod tetigit non ornavit" is Johnson's epitaph on Goldsmith. Show by reference to Goldsmith's writings whether the eulogy is just, or not.

7. What can you say in general of the criticism of Johnson?

8. Write a short account of *either* of the following:—(*a*) Coffee houses in England in the 18th century; (*b*) the rise of periodicals.

FIRST YEAR SESSIONAL EXAMINATION.

ENGLISH COMPOSITION.

THURSDAY, APRIL 5TH:—AFTERNOON, 2 TO 5.

1. Discuss and illustrate (preferably with original examples) want of *precision* in the right use of common nouns, adjectives of quality, and simple verbs.

2. On what ground is *Simplicity* of Diction defensible? By what selection of words is it most likely to be attained? Give three original examples.

3. Explain and illustrate :—Affectation of Latinity, Vulgarism, Localism.

4. "The emphatic positions in the sentence are the beginning and the end." Discuss this fully, with examples of your own invention.

5. What is a Balanced Sentence? Construct a sequence of at least three original sentences showing the effect of balancing.

6. Note the chief points essential to the construction of a paragraph.

7. Write an essay of at least three pages on any *one* of the followin subjects :

A. Progress of Modern Photography.

B. Affectation.

C. Our Country's Future.

FIRST YEAR SESSIONAL EXAMINATION.

ENGLISH LITERATURE [*Spalding*] [*for Stanstead*]

THURSDAY, APRIL 5TH :—MORNING, 9 TO 12

1. (*a*) Write briefly on the influences which shaped the literary history of England in the 16th Century.

(*b*) For what special benefits is English Literature indebted to Henry Howard, Earl of Surrey?

2. (*a*) Explain the difference between a Morality, a Miracle and a Mystery play.

(*b*) What do you mean by "the Unities?"

3. Name the plays of Shakespere, showing in your list some regard for chronological order.

4. Describe as fully as you can the motive, the form and the contents of "The Faerie Queene."

5. Name Milton's shorter poems, and give some idea of the character of each.

6. Name one work by each of the following : Hugh Latimer, Roger

Ascham, Sir David Lindsay, Richard Hooker, Sir Thomas Browne, Abraham Cowley.

7. Assign authors to the following works: Utopia, The Mirror for Magistrates, Novum Organum, Leviathan, Cooper's Hill, Essay of Dramatic Poesy, Essay concerning Human Understanding, Samson Agonistes.

8. Name the authors of the following quotations and the piece in which each occurs:

"Her angel's face
As the great eye of heaven shined bright
And made a sunshine in the shady place."

"As good almost kill a man as kill a good book."

"Hesperus entreats thy light,
Goddess excellently bright!"

"Athens, the eye of Greece, mother of arts
And eloquence, native to famous wits."

"Where the remote Bermudas ride
In the ocean's bosom unespy'd."

FIRST YEAR SESSIONAL EXAMINATION.

HISTORY.

FRIDAY, APRIL 6TH:—AFTERNOON, 2 TO 4.30.

1. Name four great subdivisions of History, and justify the importance of each by historical examples.

2. Explain the terms, "ancient," "mediaeval" and "modern," and show how, notwithstanding the continuity of history, they represent real differences.

3. Connect:

(*a*) the Mediterranean;

(*b*) the Alps, with the course of European History.

4. What do you understand by the term, "Revival of Learning"? Answer this question in detail, and give a list of the men whom you would connect with the movement in question.

5. Describe the course of the French Revolution prior to the appearance of Napoleon.

6 Make short notes on: Hohenstaufen; Louis XI of French; Council of Constance; Wars of the League; Thirty Years' War; Mazarin; "The Great Elector;" Partition of Poland; "The Hundred Days;" Cavour

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FIRST YEAR SESSIONAL EXAMINATION.

EUROPEAN HISTORY (*for Morrin College*).

FRIDAY, APRIL 6TH:—AFTERNOON, 2 TO 4

Answers to any six will count a full paper.

1. Outline (*a*) the Political, (*b*) the Social, and (*c*) the Religious organization of Homeric Greece.

2. Show how Roman territory was increased during the progress of the three Punic Wars.

3. What causes led to the dissensions of the Gracchi?

4. What were the leading characteristics of the Teutonic Barbarians?

5. Describe the civilization and religion of the Saracens.

6. Outline the great movements of the Renaissance Era.

7. Describe the growth of World Politics in the 19th Century.

INTERMEDIATE EXAMINATION.

ELIZABETHAN LITERATURE.

FRIDAY, APRIL 6TH:—MORNING, 9 TO 12.

[*McGill students take group A. Morrin students take group B., and select two questions from group A.*]

A.

1. Explain the structure of the sonnet, and give the names of the chief Elizabethan sonnet writers.

2. Discuss the influence of Italian novels on Elizabethan literature mentioning some of the works which show signs of it.

3. Give an outline of "Mother Hubberds Tale" *or* "Colin Clouts Come Home Again."

4. Explain the following passages in Spenser's poems, and say where they occur:—

(*a*) The rugged forhead, that with grave foresight
Welds kingdomes causes and affaires of state,
My looser rimes (I wote) doth sharply wite
For praising love as I have done of late,
And magnifying lovers deare debate.

(*b*) Thou kenst not, Percie, howe the ryme should rage,
O! if my temples were distaind with wine,
And girt in girlonds of wild Yvie twine,
How I could reare the Muse on stately stage,
And teache her tredd aloft in buskin fine,
With queint Bellona in her equipage.

(*c*) The God of shepheards, Tityrus, is dead,
Who taught me homely, as I can, to make.

(*d*) Nathlesse doe ye still loud her prayses sing,
That all the woods may answer, and your eccho ring.

(*e*) For of the soule the bodie forme doth take;
For soule is forme, and doth the bodie make.

5. Set forth Marlowe's contributions to the development of the drama, and mention some of Shakespere's plays which give evidence of his influence.

6. Enumerate the chief tests employed in determining the chronological order of Shakespere's plays, and give examples of their application. Make a list of the comedies in the probable order of composition.

7. Mention the plays in which the following characters appear:—Antonio, Bolingbroke, Caliban, Falstaff, Hotspur, Moth, Puck, Rosalind.

8. State what appear to you to be the leading features in the character of Hamlet.

B.

9. What are the various significations of The Faerie Queene?

10. Explain what is meant in the poem by *Una*, *Archimago*, *Acrasia*, *Orgoglio*, *Florimel*, *Britomart*.

11. Sketch the growth of the drama in England.

12. Compare the character of Hamlet with that of Romeo.

13. Describe the character of Henry V. as drawn by Shakespere.

14. Outline the plot of *The Tempest* or of *Lear*.

INTERMEDIATE EXAMINATION.

ENGLISH LANGUAGE.

FRIDAY, APRIL 6TH :—AFTERNOON, 2 TO 4.

[*McGill students take Group A. Morrin students take Group B. and select two questions from Group A.*]

A.

1. "The Indo-European languages all spring from one common source." How is this conclusion arrived at?

2. Set forth the main differences between the oldest English and that of the present day in the accidence of nouns and verbs.

3. What was the effect upon the language (*a*) of the Danish inroads; (*b*) of the Norman Conquest.

4. Explain the relations between Latin and English at different periods.

5. State the origin of the following words:—abide, almanac, alms, attorney, beleaguer, church, compatible, contralto, forest, gas, justice, legal, meerschaum, mosquito, pilgrim, ship, skirt, street, tobacco, yacht.

6. Write out in modern English and comment upon the following, giving dates and authors' names:—

(*a*) Thus com lo Engelond in to Normandies hond.
& the Normans ne couthe speke tho bote hor owe speche,
& speke french as hii dude at om & hor children dude also teche.
So that heiemen of this lond that of hor blod come,
Holdeth alle thulke speche that hii of hom nome.
Vor bote a man conne frenss, me telth of him lute.

(*b*) Thys manere was moche y-used tofore the furste moreyn & ys seththe somdel ychaunged, for John Cornwal, a maystere of gramere, chaungede the lore in gramere scole, & construccion of Freynsch into Englysch.

(*c*) And that comyn englysshe that is spoken in one shyre varyeth from a nother. In so much that in my days happened that certayn marchauntes were in a shipe in tamyse, for to haue sayled ouer the sea into zelande, and for lacke of wynde thei taryed atte forlond, and wente to lande for to refreshe them. And one of theym named sheffelde, a mercer, cam into an hows and axed for mete, and specyally he axyd after eggys. And the goode wyf answerde, that she coude speke no frenshe. And the marchaunt was angry, for he also coude speke no frenshe, but wolde

haue hadde egges; and she vnderstode hym not. And thenne at laste a other sayd that he wolde haue eyren: then the good wyf sayd that she understod hym wel.

B.

7. In the growth of the English language, what influences have led to the loss of inflections?

8. Explain what is meant by *Mutation*, *Gradation*, *Analogy*, with reference to changes in language.

9. Indicate some of the main sources from which the English Vocabulary has been enriched, and also the time or times when the reception of words, from each source referred to, was most active.

THIRD YEAR SESSIONAL EXAMINATION.

ENGLISH AND RHETORIC (*First Paper*).

CHAUCER, *Prologue to Canterbury Tales.*

THURSDAY, APRIL 5TH:—AFTERNOON, 2 TO 4.

1. What can be inferred as to the education of Chaucer's time, from his description of *The Squyer*, *The Nonne*, and *A Clerk of Oxenford*?

2. Quote, or refer definitely to passages in the Prologue which show Chaucer's love for Nature.

3. Describe the *Knight* and the *Miller*.

4. Explain the italicised words in the following passages, and refer each passage to its context:

(*a*) A *limitour*, a full solempne man.
(*b*) An *anlas* and a *gipser* al of silk.
(*c*) A solempne and greet *fraternitee*.
(*d*) A trewe *swinker*, and a good was he.
(*e*) His woning was full fair upon an heeth.
(*f*) Full *fetis* was her cloak, as I was war.

5. Explain the italicized portions of the following words: veyne; *y*-ronne; slepe*n* (indicative); att*e*; and faire ryde; som-*del*; goode; tappe*stere*; *for to* delen; vit*aille*, lond.

6. Give the meanings (and nothing else) of *thing*, *courtepy*, *taille*, *sawce-flem*, *hente*, *burdoun*, *verniele*, *stoor*, *Gat-tothed*; also of the line *By water he sente hem hoom to every lond.*

THIRD YEAR SESSIONAL EXAMINATION.

RHETORIC.

THURSDAY, APRIL 5TH:—AFTERNOON, 4 TO 6.

1. Discuss the various meanings attached to the word *Style*; and give original illustrations.

2. Distinguish fully, with examples, between the *explanatory* and the *aesthetic* employment of: Simile, Antithesis, Climax.

3. What is meant by *Plan* in Description? According to what conceptions are such plans framed? Illustrate your answer.

4. Make notes on:—the movement of narration, the emphatic effect of repetition, the construction of a story, exposition by amplification.

5. What general precepts may be given for the classification of arguments? Apply such precepts to any *one* of the following themes:—

A. A Plea for a Universal Language.

B. The Necessity for Literary Criticism.

C. Freedom of Opinions.

6. Discuss, in a short composition, the function of the Novel in Modern Life from any *one* point of view.

B.A. EXAMINATION IN ENGLISH LITERATURE.

POETS OF THE NINETEENTH CENTURY (*First Paper*).

THURSDAY, APRIL 5TH:—AFTERNOON, 2 TO 5.

(Students of McGill College will answer the questions under *A*: Students of Morrin College those under *B*.)

A.

1. State in what connection as regards Tennyson's art or thought the following poems were alluded to:

(*a*) *Claribel.*

(*b*) *Supposed Confessions of a second-rate Sensitive Mind.*

(*c*) *The Owl.*

(*d*) *The Poet.*

(*e*) *Love and Death.*

(*f*) *To J. M. K.*

(*g*) *The Lady of Shalott.*

(*h*) *The Miller's Daughter.*

(*i*) *The Palace of Art.*

(*j*) *St. Agnes' Eve.*

(*k*) *Will Waterproof's Lyrical Monologue.*

2. Trace the course of thought in *The Two Voices.*

3. Sketch the characters of the chief figures in *The Princess.*

4. (*a*) Write a page on the characteristics of famous English monodies referred to in connection with *In Memoriam.*

(*b*) Select and arrange in logical order six of the most important views in *In Memoriam*, accompanying them with *brief* quotations.

5. Describe Arthur and life at his court as pictured in the general body of French romance.

6. Notice (*a*) elevation and debasement of character in the general course of Arthurian romance, (*b*) myth in Malory's account of Gawain.

7. Two Merlins or one? Answer clearly but briefly.

8. Give in a page a picture of Tennyson's Camelot.

9. Refer the following lines to their place in *Maud* and state the comment to which they gave rise:

(*a*) Nothing but idiot gabble.

(*b*) Now to the scream of a madden'd beach dragg'd down by the wave.

(*c*) Void of the little living will.

(*d*) Last night when the sunset burn'd
On the blossom'd gable-ends.

(*e*) Sighing for Lebanon,
Dark cedar.

(*f*) Knew that the death-white curtain meant but sleep.

10. Name the chief source of *Geraint and Enid*, and contrast the poem with it.

B.

1. How was Wordsworth influenced by the French Revolution?

2. Watson speaks of the "wizard twilight" of Coleridge: How far do you regard that as an adequate characterization of Coleridge? Quote or refer to poems or passages in support of your answer.

3. Shelley has been called a Pantheist; explain why, and refer to poems or passages in this connection.

4. "Browning's supreme interest is in character." Show, by reference to at least two poems, that such is the case.

5. Tennyson has more interest in institutions than Browning. Explain what is meant and illustrate.

6. What is Tennyson's attitude to Science?

B.A. ORDINARY.

ENGLISH LITERATURE (*Second Paper*).

FRIDAY, APRIL 6TH:—AFTERNOON, 2 TO 5.

1. Name the author of each of the following extracts, and name the particular poem from which each is taken;

(*a*) For words like nature half reveal
And half conceal the soul within.

(*b*) Oh 'twas an unimaginable sight,
Clouds, mists, streams, watery rocks, and emerald turf.

(*c*) They flash upon that inward eye
Which is the bliss of solitude.

(*d*) We mortals cross the ocean of this world
Each in his average cabin of a life.

(*e*) With such content in every snuffle
As the devil inside us loves to ruffle.

(*f*) The swan on still St. Mary's Lake
Floats double, swan and shadow.

(*g*) And found a bright body surpassingly fair.

(*h*) The one red leaf, the last of its clan
That dances as often as dance it can.

(*i*) The tear that gathered in his eye
He left the mountain breeze to dry.

(*j*) And beauty born of murmuring sound
Shall pass into her face.

(*k*) With fire and sword the county round
Was wasted far and wide.

(*l*) I find it hard
To be a Christian.

(*m*) There was a time when though my path was rough
This joy within me dallied with distress.

(*n*) The waves rush in on every side,
The ship is sinking beneath the tide.

(*o*) In listening mood she seemed to stand
The guardian Naiad of the strand.

(*p*) Forever wilt thou love and she be fair.

(*q*) His wandering step,
Obedient to high thoughts, has visited
The awful ruins of the days of old.

(*r*) Then comes the statlier Eden back to man

(*s*) 'Tis a fearful light:
No sun, no moon, no lights innumerable.

(*t*) He is a portion of the loveliness
Which once he made more lovely.

(*u*) Derives it not from what we have
The likest God within the soul.

(*v*) Choice Latin, picked phrase, Tully's every word.

(*w*) Again I revisit the hills where we sported.

(*x*) The spirits I have raised abandon me.

(*y*) The holy time is quiet as a nun
Breathless with adoration.

2. Write a sketch of the story of "Andrea del Sarto," *or* describe the three important places visited by the speaker in *Christmas Eve*.

3. What is the moral lesson conveyed in the story of "Hartleap Well?" In that of The Inch Cape Rock?

4. Quote from three to ten lines from each of any six of the poems set for private reading, and not used in question 1.

5. Give an outline of (*a*) Manfred, (*b*) Alastor.

THIRD YEAR HONOURS IN ENGLISH.

WORDSWORTH, *Prelude*; CAMPBELL, *Pleasures of Hope*.

FRIDAY, APRIL 6TH :—MORNING, 9 TO 12.

(*Answer A and B in separate books.*)

A.

1. Explain the following allusions, and state briefly but pointedly in what connection each is found :

(*a*) the name
Of Wallace to be found, like a wild flower

(*b*) vanquished Mithridates

(*c*) the vast city where I long had pined

(*d*) By a bequest sufficient for my needs
Enabled me to pause for choice

(*e*) a shattered
monument of feudal sway

(*f*) It is the sacrificial altar, fed
With living men

(*g*) that single wren
Which one day sang so sweetly in the nave

(*h*) Three Gothic courts are his

(*i*) Half-rural Sadler's wells

(*j*) ye knew him well, ye cliffs
And islands of Winander

(*k*) Its dumb cataracts and streams of ice

(*l*) Ere Phœbe sighed for the false Ganymede

(*m*) but vows
Were then made for me.

(*n*) "Stay, stay your sacrilegious hands

(*o*) "'Tis against that
That we are fighting"

(*p*) thy most eloquent tongue,
Now mute, for ever mute

(*q*) Gehol's matchless gardens

2. Gve an account of Wordsworth's life at Hawkshead.

3. Dscribe (*a*) the model boy.
(*b*) the scene on which Wordsworth gazed when the news of Robe-pierre's f l l reached him.
(*c*) the model preacher.

HONOUR ENGLISH.

4. Trace the growth of the poet's love of nature as indicated in the *Prelude*.

B.

1. Write a short critical review of *The Pleasures of Hope*.

2. What can you say of Campbell's feeling (*a*) for Liberty, (*b*) for domestic life? Illustrate by reference and quotation.

3. Write short explanatory notes on :—

(*a*) And such thy strength inspiring aid that bore
The hardy Byron to his native shore.

(*b*) his sapient eye
The loved Athenian lifts to realms on high.

(*c*) Iona's Saint, a giant form,
Throned on her towers, conversing with the storm.

4. Give some idea of the context of the following, quoting when it is possible :

(*a*) And aimless Hope delights her darkest dream.

(*b*) Expression pour'd
Her mingling spirit there—and Greece adored.

(*c*) Spouse of the worm, and brother of the clay.

(*d*) Oh ! Star-eyed Science, hast Thou wandered there ?

(*e*) And hears thy stormy music in the drum

(*f*) And holy men give Scripture for the deed.

THIRD YEAR HONOURS IN ENGLISH.

SPENSER : *The Shepheards Calendar ; Faerie Queene*, Bk. I.

SATURDAY, APRIL 7TH :—MORNING, 9 TO 12.

1. (*a*) What development of pastoralism is not visible in *The Shepheards Calendar*? What new elements are found in Spenser's poem ?

(*b*) Notice characteristics of the pastoralism of

(*a*) Theocritus

(*b*) Petrarch.

(*c*) Sannazaro.

(*d*) Marot.

2. Name the three divisions of Spenser's pastorals. Notice pastoral constants and refer to Spenser's poem in proof.

3. Give some account (*a*) of Archbishop Grendal and prophesyings, (*b*) of Smerwick Bay.

(*b*) Give an outline of the July Æglogue (*Thomalin-Morrell*).

4. What fables are found in Spenser's poem? Give an outline of them.

5. Write on (*a*) the Spenserian Stanza, (*b*) St. George.

6. Notice the main points in the preparatory letter to *The Faerie Queene*.

7. Describe Arthur.

8. Trace the Red Cross Knight through the first book and explain the allegory as you proceed.

9. Give the meaning (and nothing else) of the following words: amis, avale, bowre, darrayne, faytor, gobbet, lin, parbreake, recreaunt, sam.

10. Describe the children of Dame Cœlia.

THIRD YEAR HONOURS IN ENGLISH AND HISTORY.

SIDNEY, *Apologie;* MILTON, *Areopagitica.*

MONDAY, APRIL 9TH:—MORNING, 9 TO 12.

(*Write the answers to A. and B. in separate books*

A.

1. What is Sidney's definition of poetry? To what extent do you agree with him in it?

2. Criticise Sidney's style.

3. Give the substance of Sidney's description, (*a*) of moral philosophers, (*b*) of historians.

4. Write on Sidney's idea of poetry as a moral force.

5. (*a*) What was Sidney's test of mediocre poetry?

(*b*) Quote or give the substance of his opinion of grammar.

6. In what connection do the following occur?

(*a*) Alas! Love, I would thou could'st as well defend Thyself as Thou canst offend others.

(*b*) indeed stony and beastly people.

(*c*) See we not valiant Miltiades rot in his fetters?

(*d*) Though laughter may come with delight, yet cometh it not of delight.

(*e*) Seven cities strove who should have him for their citizen.

B.

1. State what you know concerning the history of book licensing in England, giving dates.

2. Contrast Milton and Isokrates.

3. Briefly refer the following extracts to the subjects or arguments with which they are connected:

(*a*) three principall things, without which all praising is but Courtship and flattery. (Name the three.)

(*b*) Give her but room, and do not bind her when she sleeps.

(*c*) I know they are as lively as those fabulous Dragons teeth.

(*d*) who both for his life and for his death deserves, that what advice he left be not laid by without perusall.

(*e*) the first that brought out of Ionia the scatter'd works of Homer.

(*f*) some cutting, some squaring the marble.

(*g*) and had the honour to be set forth the second time by Cicero.

(*h*) preferr'd the naturall wits of Britain.

(*i*) the first that excommunicated the reading of hereticall Books.

(*j*) he shall bring together every joynt and member.

(*k*) who thought it no defilement to insert into holy Scripture the sentences of three Greek poets, and one of them a Tragedian.

(*l*) is at his Hercules pillars in a warm benefice.

(*m*) more then might have well suffic'd the heartiest feeder thrice as many meals.

(*n*) makes the very person of that man his religion.

(*o*) a fugitive and cloister'd vertue.

(*p*) licence it like our broad cloath and our wooll packs.

(*q*) he had bin else a meer artificiall Adam.

4. Give the meaning of the words and explain the allusions. Refer the allusions to their place in the argument: him who went about to impaire your merits; Dion Prusus; quadrigesimal; museless; Padre Paolo; encroachment; Lambeth House; Lullius; the two Apollinarii; Morgante; our sage and serious poet Spencer; Monte Mayors Sensible; ferular; ding; enchiridion; Galileo; dividuall; the Hercynian wilderness; subdichotomies; the Chappell at Westminster.

THIRD YEAR HONOURS IN ENGLISH AND HISTORY.

EARLY ENGLISH: CHAUCER, *Parlement of Foules.*

WEDNESDAY, APRIL 11TH:—MORNING, 9 TO 12.

1. Translate literally:

Hii todraweth the sely bondemen. as hii wolde hom hulde, ywis;
They me wepe & crie on hom. no mercy ther nis.
Vnnethe was ther eni hous. in al Normandie
Of religion, as abbey. other priorie,
That king Willam ne feffede. here in Engelonde
Mid londes, other mid rentes. that hii abbeth here an honde,
As me may wide aboute. in moni contreye ise,
Ware-thoru this lond nede mot. the pouerore be.

He *g*al & hupte & drou*g* a*g*e. & makede grislich bere,
He nolde for al his bi*g*ete. that he hadde icome there.
Mid his tonge he snytte hire nose. & tuengde hire sore,
For hit was with-inne the ny*g*te. he ne mi*g*te iseo nomore.
The schrewe was glad & blithe ynou*g*. the he was out of his honde,
He fle*g* & gradde bi the lifte. that me hurde in-to al the londe:
'Out! what hath the calewe ido. what hath the calewe ido!'
In the contrai me hurde wide. hou the schrewe gradde so.
As god the schrewe hadde ibeo. atom, ysnyt his nose,
He ne hi*g*ede no more thiderward. to hele him of the pose.

God that giues wrekes me to,
And vnders folk vnder me so,
Mi leser artou, night and dai,
Fra mi faes ben wrathful ai,
And fra in me risand vpheue sal-tou me;
Fra wicke man outtake me to fle.
For-thi in birthes sal I to the schryue,
Lauerd, and to thi name salm sai mi liue.

Heles of his king mikeland,
And als swa mercy doand
To his crist, that es Dauid,
And to his sede til in werld thar wid.

This see mikel and roume til hende,
Thar wormes, of whilk es nan ende;
Bestes smaller with the mare.
Thider schippes sal ouerfare;
This dragoun that thou made biforn,
For to plaie with him in skorn.
Alle fra the thai abide,
That thou gif tham mete in tide.
Giueand the to tham, gedre thai sal
The oppenand thi hand with-al,
Alle sal thai, mare and lesse,
Be fulfilled with thi godenesse.

This worldes loue ys a wrecche,
Whose hit here, me ne recche,
Thah y speke heye;
For y se that on brother
Lutel recche of that other,
Be he out of ys ege.
'Fer from ege, fer from herte';
Quoth Hendyng.

The mone mandeth hire lyht,
So doth the semly sonne bryht,
When briddes singeth breme;
Deawes donketh the dounes,
Deores with huere derne rounes,
Domes forte deme;
Wormes woweth vnder cloude,
Wymmen waxeth wounder proude,
So wel hit wol hem seme,
gef me shal wonte wille of on:
This wunne weole y wole forgon,
Ant wyht in wode be fleme.

2. Give an outline of the tale of Pers the Usurer.

3. Translate literally:

Ac water is kendeliche cheld,
Thag hit be warmd of fere;
Ther-fore me mey cristni ther-inne
In whaut time falthe a gere
Of yse;
So mey me naugt in ewe ardaunt,
That neth no wateris wyse.
Al-so me may inne sealte se
Cristny wel mitte beste;
And eke inne othere sealte watere,
Bote me in to moche keste
Of sealte;
For gef that water his kende lest.
That cristning stant te-tealte.
That on his cleped cristning of blode,
Wanne suche bledeth for Criste;
That other of the Holi Gost,
That moge mid none liste
Be icristned;
And deyeth so, wanne hi beth deede,
In heuene hi beth igistned.
The children atte cherche dore
So beth yprimisined;
And that hi beeth eke atte fount
Mid oylle and creyme alyned,
Al faylleth;
Higt wortheth cristnyng,
And that child ther-to hit auailleth.

4. Write on the spectacular element in Chaucer's poem.

5. Give

(*a*) the substance of the inscriptions over the gate.

(*b*) an outline of Nature's first address to the birds.

(*c*) the substance of the three speeches of the tercels.

6. Is *The Parlement of Foules* original? Enter into precise detail.

7. Give the meaning of the following words and refer them to the text: sheter, thorpes, golee, soleyn, bourded.

8. Write on those features of *The Parlement of Foules* which have impressed you most, and connect them, when you can, with other poetry of Chaucer.

THIRD YEAR HONOURS IN ENGLISH AND HISTORY.

ADDISON :—*Papers on the Imagination* and *Paradise Lost.*
DRYDEN :—*Annus Mirabilis, Absolom and Achitophel, Preface to Fables.*

WEDNESDAY, APRIL 18TH :—MORNING, 9 TO 12.

(*Write the answers to A and B in separate books.*)

A.

1. State very briefly how Addison treats the following matters :
   (*a*) *Sir Francis Bacon* in his Essay upon Health
   (*b*) the Fancy is capable of receiving a new satisfaction by the assistance of another sense
   (*c*) the Final cause of our delight in what is (*a*) great, (*b*) new (*c*) beautiful
   (*d*) rocks and grottos
   (*e*) a statue of Alexander
   (*f*) the two requisites for forming a right judgment of a description
   (*g*) a contrast between Homer, Virgil and Ovid (one particular will be sufficient)
   (*h*) pleasure in reading melancholy descriptions
   (*i*) an admirable talent in *Spenser*
   (*j*) Mr. Dryden
   (*k*) the polite masters of morality, criticism and other speculations abstracted from matter

2. Elucidate briefly,
   (*a*) Aristotle's similitude regarding the Greatness of the action
   (*b*) the characters of Adam and Eve
   (*c*) a comparison between Æneas and the principal actors in Paradise Lost
   (*d*) one instance of impropriety in Virgil and Milton
   (*e*) Milton's treatment of the letter *y*
   (*f*) digressions in Paradise Lost
   (*g*) the part of Moloch
   (*h*) the visit of Satan to the sun

(*i*) Raphael's behaviour

(*j*) the golden compasses

(*k*) a comparison between *Paradise Lost* and *Prometheus Bound.*

3. Give in tabular form the various kinds of essayists prior to Addison, with the titles of typical works.

B.

1. (*a*) Write a brief outline of Annis Mirabilis.

(*b*) Criticise the poem.

2. Make notes explanatory and critical on the following passages, and refer each to its proper setting in the poems :—

(*a*) And this may prove our second Punic war.

(*b*) So hear the scaly herd when Proteus blows.

(*c*) Thus as an offering for the Grecian state,
He first was killed who first to battle went.

(*d*) And some by aromatic splinters die.

(*e*) Then we upon the world's last verge shall go
And view the ocean leaning on the sky.

(*f*) Find him disowning of a Bourbon foe
And him detecting a Batavian fleet.

(*g*) The ghosts of traitors from the Bridge descend.

(*h*) Meantime he sadly suffers in their grief,
Outweeps a hermit and outprays a saint.

(*i*) The thrifty Sanhedrin shall keep him poor.

(*j*) They who, when Saul was dead, without a blow
Made foolish Ishbosheth the crown forego.

(*k*) To compass this the triple bond he broke.

3. Describe the characters of Achitophel, Zimri, Barzillai and Corah, and show, by reference to the characters disguised under these names, whether the satire is just

4. (*a*) Give the substance of Dryden's comparison of Homer and Virgil.

(*b*) Of Ovid and Chaucer.

(*c*) How does his estimate of Chaucer compare with that of a representative modern critic?

THIRD YEAR HONOURS IN ENGLISH AND HISTORY.

MILTON: *Shorter Poems and Life.*

THURSDAY, APRIL 19TH:—MORNING, 9 TO 12.

1. Justify, with illustrations, the statement that Milton is the last of the Elizabethans.

2. State from what poems the following lines are taken:

(*a*) Next her much like thee in story

(*b*) The horned moon to shine by night

(*c*) The labour of an age in piled stones

(*d*) Yet can I not persuade me thou art dead

(*e*) Her thirty arms along the indented meads

(*f*) See, see the chariot and those rushing wheels

Give as precisely as you can the context of (*c*), (*e*), (*f*), and explain the reference in (*a*).

3. Give the meaning of the following words in *L'Allegro* and *Il Penseroso*, write the line in which each is found and refer the line to the division of the poem to which it belongs: virtuous; grain; Cynosure; rebecks; secure; mansion; store; plat.

4. Quote a passage of not more than ten lines in the body of *L'Allegro* and the corresponding passage in *Il Penseroso*.

5. (*a*) Name the earliest English masque and the last before the Restoration; also the writers of the libretto.

(*b*) Name the two most productive writers of English masques.

(*c*) Briefly show the intention of the Anti-masque and give an illustration.

(*d*) Make a note on *The Triumph of Peace*.

(*e*) Who was the writer of *Histriomastix*? What was its effect?

6. In regard to *Arcades*, state (*a*) who the Countess Dowager of Derby was; (*b*) the references to classical mythology or locality made regarding her in the songs of the piece and explain them; (*c*) where the entertainment was presented. Name a poem of Spenser dedicated to her.

7. (*a*) State precisely where *Comus* was presented. (*b*) State who took the following parts: Thyrsis, The Lady. (*c*) What reference

is made to the wanderings of Comus? (*d*) What is the effect of the potion? (*e*) How and where does Comus allude to his mother?

8. Give an outline of the first speech of the Lady ["This way the noise was if mine ear be true."]

9. Refer the following lines to their speakers and say where each occurs:

(*a*) She that has that, is clad in complete steel
(*b*) Trip the pert fairies and the dapper elves
(*c*) An old and haughty nation, proud in arms
(*d*) For who would rob a hermit of his weeds?
(*e*) like a neglected rose
It withers on the stalk
(*f*) Three fair branches of your own

10. Give an outline of *Comus* from the descent of Sabrina to the end.

11. Write briefly on:

(*a*) the head master of St. Paul's in Milton's day.
(*b*) the studies of the upper forms at St. Paul's when Milton was there.
(*c*) Milton's position regarding divorce.
(*d*) Milton's views concerning the study of poetry.
(*e*) Milton's views concerning physical exercise.
(*f*) Milton's views concerning the right form of church government.
(*g*) Milton's contribution to the Smectymnuan controversy.

THIRD YEAR HONOURS IN ENGLISH AND HISTORY.

BURKE AND LESLIE STEPHEN.

FRIDAY, APRIL 20TH:—MORNING, 9 TO 12.

(*Write your answers to A and B in separate books.*)

A.

1. What are Burke's views as to
(*a*) The right of succession to the British Crown,
(*b*) The authority of peoples over their monarchs,
(*c*) The composition of the Tiers Etat in the National Assembly.

2. Write on Burke's attitude towards Democracy, noting especially the tendency which he saw in the new democracy in France.

3. How does Burke speak of the writings (*a*) of Bolingbroke, (*b*) of Rousseau?

4. Write on the views expressed in "The Reflections" on

(*a*) The uses of an Established Church.

(*b*) The French Clergy.

(*c*) The method of raising a revenue adopted by the National Assembly.

5. "To make a revolution is a measure which *prima fronte* requires an apology."

Develop this idea on the lines of Burke's arguments.

B.

1. What has Leslie Stephen to say on

(*a*) The Letters of Junius.

(*b*) Power arising from popularity.

(*c*) Johnson's Political Theory.

(*d*) Ferguson's Essay on the History of Civil Society.

(*e*) The Federalist.

2. Write on Burke as a politician, making specific reference to speeches and writings.

3. Give briefly the opinions of Montesquieu's work held respectively by Burke and Leslie Stephen.

4. Amplify and explain:

"Had England suffered a revolution, Godwin might have been its Condorçet as Paine might have been its Marat."

5. Discuss Godwin's doctrine of Individualism.

THIRD YEAR HONOURS IN ENGLISH AND HISTORY.

ANGLO-SAXON (*First Paper.*)

MONDAY, APRIL 23RD:—MORNING, 9 TO 12.

1. Translate:—

Se hwæl bith micle læssa thonne othre hwalas; ne bith he lengra thonne syfan elna lang; ac on his agnum lande is se betsta

hwælhuntath: tha beoth eahta and feowertiges elna lange, and tha mæstan, fiftiges elna lange; thara he sæde thæt syxa sum ofsloge syxtig on twam dagum.

ofsloge: conjugate the past tense indicative.

(*b*) Ac hyra ar is mæst on thæm gafole the tha Finnas him gyldath. Thæt gafol bith on deora fellum, and on fugela fetherum, and hwales bane, and on thæm sciprapum, the beoth of hwæles hyde geworht, and of seoles. Æghwilc gylt be hys gebyrdum. Se byrdesta sceall gyldan fiftyne mearthes fell, and fif hranes, and an beren fell, and tyn ambra fethra, and berenne kyrtel oththe yterenne, and twegen sciprapas; ægther sy syxtig elna lang, other sy of hwæles hyde geworht, other of sioles.

decline *fell* (*n*) and *twegen*.

2. Tha foron hie to, ond gefliemdon thone here, ond thæt geweorc abræcon, ond genamon eall thæt thær binnan wæs, ge on feo, ge on wifum, ge eac on bearnum, ond brohton eall inn to Lundenbyrig; ond tha scipu eall oththe tobræcon, oththe forbærndon, oththe to Lundenbyrig brohton, oththe to Hrofesceastre; ond Hæstenes wif ond his suna twegen mon brohte to thæm cyninge, ond he hi him eft ageaf, for thæm the hiora wæs other his godsunu, other Ætheredes ealdormonnes.

Give the principal parts of the strong verbs.

3. Gyf thu thæt gerædest, the her ricost eart,
thæt thu thine leoda lysan wille.
syllan sæmannum on hyra sylfra dom
feoh with freode, and niman frith æt us,
we willath mid tham sceattum us to scype gangan,
on flot feran, and eow frithes healdan.
Byrhtnoth mathelode, bord hafenode,
wand wacne æsc, wordum mælde,
yrre and anræd, ageaf him andsware:
Gehyrst thu, sælida, hwæt this folc segeth?
hi willath eow to gafole garas syllan,
ættrene ord and ealde swurd,
tha heregeatu the eow æt hilde ne deah.

4. 'Hwæt thu, Ælfwine, hafast ealle gemunde,
thegenas to thearfe; nu ure theoden lith,
eorl on eorthan, us is eallum thearf

thæt ure æghwylc otherne bylde
wigan to wige, tha hwile the he wæpen mæge
habban and healdan, hearpine mece,
gar and god swurd. Us Godric hæfth,
earh Oddan bearn, eallè beswicene:
wende thæs for moni mann, tha he on meare rad,
on wlancan tham wicge, thæt hit ure hlaford;
for than wearth her on felda folc totwæmed,
scyldburh tobrocen: abreothe his anginn,
thæt re her swa manigne mann aflymde.'

5. Scan: Huru ne gemunde mago Ecglafes
eafothes cræftig, thæt he ær gespræc
wine druncen, tha ne thæs wæpnes onlah
selran sweordfrecan: selfa ne dorste
under ytha gewinn aldre genethan.

THIRD YEAR HONOURS IN ENGLISH AND HISTORY.

ANGLO-SAXON (*Second Paper.*)

MONDAY, APRIL 23RD:—AFTERNOON, 2 TO 4.

Translate at sight;—

Tha æfter Oswoldes slege feng Oswig his brothor to Northymbra rice, and rad mid werode to thær his brothor heafold stod on stacan gefæstnod, and genam thæt heafod and his swithran hand, and mid arwurthnysse ferode to Lindisfarnea cyrcan Tha wearth gefylled, swa we her foresædon, thæt his swithre hand wunath hal mid tham flæsce butan ælcere brosnunge, swa se bisceop gecwæth. Se earm wearth geled arwurthlice on scrine, of seo fre asmithod, on Sancte Petres mynstre binnan Bebban-byrig be thære sæ strande, and lith thær swa ansund swa he of-aslagen wæs.

On sunnan mergen he gewat tha tha he wæs on ylde
an and hund eahtatig wintre and æfter cristes throwunge
feower hund wintre and twelf on getele;
and fela manna tha gehyrdon on his forth-sithe
singendra engla swithe hlude stemna
upon heanysse geond tha heofenas swegende,
swa hit on bocum sægth the be him synd awritene.

His lic wearth gesewen sona on wuldre
beorhtre thonne glæs, hwittre thonne meolc
and his andwlita scean swithor thonne leoht.

ÆLFRIC, *Life of St. Martin.*

GENERAL QUESTIONS.

1. Make notes on the italicized portions of the following words :—*o*ther, *ge*s, læran, wæron, thegen, here, ciesth, wunderlice, *to*-twæman; *a*brecan.

2. Make notes on Orosius. What was said concerning Extract IV? (*Ohthere and Wulfstan*).

3. Decline (*a*) sunu
(*b*) eage
(*c*) til
(*d*) ic

4. (*a*) Conjugate any strong verb in full.

(*b*) Give the classes of the strong and also of the weak verbs with an example of each not to be found in this paper.

POST GRADUATE COURSE.

ICELANDIC.

FRIDAY, APRIL 6TH :—AFTERNOON, 2 TO 4.

1. Translate :

(*a*) Thorr *er asanna framastr*, sa er *kallathr* er Asa-thorr etha Oku thorr ; hann er sterkastr allra guthanna ok manna. Hann *a* thar riki re Thruth-vangar heita, en holl hans heitir Bilskirnir ; i theim sal eru fimm hundruth golfa ok fjorir tigir ; that er hus mest, sva at menn hasa *gört*.

Parse the italicized words in the above extract.

(*b*) Tha var tekit trog eitt, ok borit in a hallar-golfit, ok fylt of slatri ; settisk Loki at othrum enda, on Logi at othrum, ok at hvarr-tveggja sem tithast, ok mœttusk i mithju treginu ; hafthi tha Loki etit slatr alt af beinum en Logi hafthi ok etit slatr alt ok beinum meth, ok sva trogit ; ok syndisk nu ollum sem Loki hefthi latit leikinn.

(*c*) En er thu drakkt af horninu, ok thotti ther seint litha—en that veit trua min, at tha varth that undr, er ek munda eigi trua at vera mætti; annarr endir hornsins var ut i hafi, en that sattu eigi ; en nu, er thu komr

til sævarins, tha mun-tu sja mega, hvern thurth thu hefir drukkit a sænum. That eru nu fjorur kallathar. Ok enn mælti hann: eigi thotti mer hitt minna vera vert, er thu lyptir upp kettinum, ok ther satt at segja, tha hræddusk allir their er sa, er thu lyptir af jorthu einum fœtinum ; en sa kottr va eigi sem ther syndisk; that var Mithgarths—ormr, er liggr um lond oll, ok vannsk honum varliga lengthin til, at jorthina tœki sporthr ok hofuth ; ok sva langt seildisk thu upp at skamt var tha til himins.

(*d*) Ok tha er konungr sjalfr hafthi a kaf hlaupit, vildu their taka hann hondum, ok fœra Eiriki jarli. En Olafr konungr bra yfir sik skildinum, ok steypthisk i kaf ; en Kolbjorn stallari skaut undir sik skildinum, ok hlifthi ser sva vith vapnum er lagt var af skipum theim er undir lagu, ok fell hann sva a sæinn at skjoldrinn varth undir honum, ok komsk hann thvi eigi i haf sva skjott, ok varth hann hand-tekinn ok dreginn upp i skutuna, ok hugthu their at thar væri konungrinn. Var hann tha leiddr fyrir jarl. En err thess varth jarl varr at thar var Kolbjorn, en eigi Olafr konungr, tha varu Kolbirni grith gefin. En i thessi svipan hljopu allir fyrir borth af Orminum, their er tha varu a lifi, Olafs konungs menn ; ok segir Hallfrethr vandrætha—skald, at Thorkell nefja, konungs brothir, hjlop sithast allra manna fyrir borth.

2. Give an outline of the story of Authun.

3. Translate :

Vreithr var tha Ving-thorr, her hann vaknathi,
ok sins hamars of saknath :
skegg nam at hrista, skor nam at dyja,
reth Jarthar burr um at threifask.

" Ok hann that ortha alls fyrst of kvath ;
beyr-thu nu, Loki, hvat ek nu mæli,
er engi veit jarthar hvergi
ne upp-himins; ass er stolinn hamri ! "

Gengu their fagra Freyju tuna,
" ok hann that ortha alls fyrst of kvath :
muntu mer, Freyja fjathr-hams lja,
ef ek minn hamar mætta-k hitta ?

4. Give some account of the Scandinavian group of languages and notice its earliest remains.

5. Notice Icelandic umlaut.

B.A. HONOURS IN ENGLISH.

ANGLO-SAXON.

FRIDAY, MARCH 30TH :—AFTERNOON, 2 TO 5.

Beowulf and the *Fight in Finnsburg*.

Translate, with notes on the form or meaning of the words in italics :

A

Nalas ꝺ hine læssan lacum teodan,
theod-gestreonum, thonne tha dydon,
the hine æt frumsceafte forth ousendon
ænne ofer ythe umbor wesende :
tha gyt hie him asetton *segen* gyldenne
heah ofer heafod leton *holm* beran,
geafon on gar-secg : him wæs geomor sefa,
murnende mod. Men ne cunnon
secgan to sothe *sele rædenne*,
hæleth under heofenum, hwa thæm hlæste onfeng.

"Hæfdon swurd nacod, tha wit on sund reon,
"heard on handa, wit unc with hron-fixas
"werian thohton. No he wiht fram me
"flod-ythum feor fleotan meahte,
"hrathor on holme, no ic fram him wolde.
"Tha wit atsomne on sæ wæron
"fif nihta fyrst, oth that unc flod todraf,
"wado weallende, wedera cealdost,
"nipende niht and northan wind
"heatho-grim andhwearf; hreo wæron ytha.

Make notes on the above episodes, and scan, naming types, the first five lines of the first extract.

Hwilum flitende fealwe stræte
mearum mæton. tha wæs morgen-leoht
scofen and scynded. Eode scealc monig
swith-hicgende to sele tham hean,
searo-wundor seon, swylce self cyning,
of bryd-bure beah-horda weard,
tryddode tir-fæst getrume micle,
cystum gecythed, and his cwen mid him
medo-stig gemæt mægtha hose.

Wæs theaw hyra,
thæt hie oft wæron an wig gearwe,
ge æt ham ge on herge, ge gehwæther thara
efne swylce mæla, swylce hira man-dryhtne
thearf gesælde; wæs seo theod tilu.

"Thonne bith on hrethre under helm drepen
"biteran stræle; him bebeorgan ne con
"wom wundor-bebodum wergan gastes;
"thinceth him to lytel, thæt he to lange heold,
"gytsath grom-hydig, nallas on gylp seleth
"fætte beagas and he tha forth-gesceaft
"forgyteth and forgymeth, thæs the him ær god sealde,
"wuldres waldend, weorth-mynda dæl.

forthon he ær fela
nearo nethende nitha gedigde,
hilde-hlemma, syththan he Hrothgares,
sigor-eadig secg, sele fælsode
and æt guthe forgrap Grendeles mægum,
lathan cynnes.

"Sona him se froda fæder Ohtheres,
"eald and eges-full ond-slyht ageaf,
"abreot brim-wisan, bryd aheorde,
"gomela io-meowlan golde berofene,
"Onelan modor and Ohtheres,
"and tha folgode feorh-genithlan
"oth thæt hi otheodon earfothlice
"in Hrefnes-holt hlaford-lease.
"Besæt tha sin-herge sweorda lafe
"wundum werge, wean oft gehet
"earmre teohhe andlonge niht:
"cwæth he on mergenne meces ecgum
"getan wolde, sume on galg-treowum
"fuglum to gamene. Frofor eft gelamp
"sarig-modum somod ær-dæge,
"syththan hie Hygelaces horn and byman
"gealdor ongeaton. Tha se goda com
"leoda dugothe on last faran.

Tha git Garulf Guthere styrode,
thæt hie swa freolic feorh forman sithe
to thære healle durum hyrsta ne bæran,
nu hyt nitha heard anynam wolde:
ac he frægn ofer eal undearninga,
deor-mod hæleth, hwa tha duru heolde.

B.

Translate and write explanatory notes on: ellen fremedon (3); feond on helle (101); orcneas (112); geatolic (215); ær he on weg hwurfe (264); he on heothe gestod (404); ymb brontne ford (568); ealu-scerwen (770); horn-geap (984); walan (1032).

C.

Translate:—Swat ædrum sprong; ærran mælum; stræla storm strengum gebæded; gold unrime grimme geceapod; tha hyne sio thrag becwom; feorh-bennum seoc; wilna gad.

D.

Make notes on Dæghrefn; Offa; Hæthcyn; Finn.

B.A. HONOURS IN ENGLISH.

SHELLEY, *Adonais*; MILTON, *Lycidas*; MATTHEW ARNOLD, *Thyrsis*.

MONDAY, APRIL 2ND:—MORNING, 9 TO 12.

1. State in what portion of *Adonais* each of the following extracts is found, and give its immediate connection in your own or the poet's language:

(*a*) He came the last, neglected and apart.

(*b*) The shadow of white Death.

(*c*) "The Pythian of the age."

(*d*) I am borne darkly fearfully afar.

(*e*) Lost Angel of a ruined Paradise.

(*f*) "Thou art become as one of us."

(*g*) pierced by the shaft which flies
In darkness.

(*h*) "I would give
All that I am to be as thou now art."

(*i*) its wrecks like shattered mountains rise

(*j*) Death rose and smiled and met her vain caress.

2. Give the substance of the stanza in which the following are spoken of (*a*) Byron and Moore, (*b*) Chatterton, Sidney and Lucan, (*c*) Morning, (*d*) Echo.

3. Give the date of the publication of *Adonais*, and make a few notes on the title of the poem. In about a page describe with illustrations from *Adonais*, the characteristics of Shelley as a poet.

4. Make a few notes on the title *Lycidas*. Display, with precision, the biographical element in the poem.

5. (*a*) Show in what way Milton mentions Damœtas, Deva, Mincius Bellenes, Hebrus, two-handed engine. Write explanatory notes.

(*b*) Give five examples of words or phrases illustrative of Milton's "classical" use of English and write the lines in which they occur.

6. "Weep no more, woful shepherds, weep no more." Give an outline of the poem to the end.

7. Connect as regards their inner spirit, *Dover Beach*, *The Scholar-Gipsy* and *Thyrsis*, and quote from *Thyrsis* as you do so.

8. Indicate references in *Thyrsis* to (*a*) the season of the year when the poet takes his walk, (*b*) Oxford, (*c*) the cuckoo, (*d*) the Cumner cowslips (*e*) the throne of Truth.

9. Write with terse but exact illustration on the assumed pastoral element in *Thyrsis*.

B. A. HONOURS IN ENGLISH AND HISTORY.

WEDNESDAY, APRIL 4TH:—AFTERNOON, 2 TO 5.

TENNYSON: *In Memoriam*. BROWNING: *Christmas Eve and Easter-Day*.

1. Connect (*a*) *In Memoriam* and *Christmas Eve*, (*b*) *In Memoriam*, and *Easter-Day*. (Limit your answer to a page in either case.)

2. Show, with precise details, reasons for regarding the poet of *In Memoriam* as the poetical son of Wordsworth.

3. Show *briefly* how, and state the point in the development of *In Memoriam* at which, illustrative use is made of the life of lovers or married persons.

4. Tracking Tennyson's thought and answering mainly in your own words, deal with three of the following matters:

(*a*) Is loss common?
(*b*) And was the day of my delight
As pure and perfect as I say?
(*c*) The power of teaching by parable.
(*d*) "So careful of the type?"
(*e*) Corruption of the body after death.
(*f*) The last walk in the garden at Somersby.

5. Give an outline of the allegory in CIII.

6. Mention the landmarks, chronological or otherwise, in *In Memoriam*, and give in a word or two a thought or statement in the first verse of each.

7. Refer the following extracts to their places in Browning's poems and briefly indicate the relation of (*b*), (*d*), (*e*), (*f*), (*g*), (*h*) to the inner thought of the poem in question :

(*a*) Led himself in by some inner light
(*b*) In youth I looked to these very skies
(*c*) As if God's trusting finger grazed him
(*d*) let me strive
To find it, and when found, contrive
My fellows also take their share
(*e*) Nor seeks to have it go
Foldless and flat along the wall
(*f*) Killed not in bed but on the floor
(*g*) "My box a trifle I confess"
(*h*) What pomp in Buonarroti's brow.

8. Answer from *Easter-Day :*

(*a*) Faith plays a part in social life
(*b*) [*The Believer to the Sceptic regarding renunciation of the world*]
How do you counsel in the case ?
(*c*) The attitude of the Believer to the world when he "felt begin
The Judgment ; ("*I resolved to say*")

9. "He stood there. Like the smoke
Pillared o'er Sodom."
Complete the picture.

B.A. HONOURS IN ENGLISH AND HISTORY.

ANGLO-SAXON. (*Second Paper*). Unseen translation.

THURSDAY, APRIL 5TH :—MORNING, 9 TO 11.

A.

Translate :

Tha of thære stowe steam up aras
Swythe rec under radorum : thær aræred wearth
beornes breostsefa. He mid bæm handum

eadig ond ægleaw upweard plegade.
Ivdos mathelode gleaw in gethance:
"Nu ic thurh soth hafu seolf gecnawen
on heardum hige thæt thu hælend eart
middangeardes. Sie the, mægena god,
thrymsittendum thanc butan ende,
thæt thu me swa methum ond swa manweorcum
thurh thin wuldor inwrige wyrda geryno.

Elene 802-812.

B.

Swa he his weorc weortheth, bi thon se witga cwæth,
thæt ahæfen wæren halge gimmas
hædre heofontungol healice upp,
sunne ond mona. Hwæt sindan tha
gimmas swa scyne buton god sylfa?
He is se sothfæsta sunnan leoma,
englum ond eorthwarum æthele scima!
Ofer middangeard mona lixeth,
gæstlic tungol, swa seo godes circe
thurh gesomninga sothes ond ryhtes
beorhte bliceth, swa hit on bocum cwith,
siththan of grundum godbearn astag,
cyning clænra gehwæs: tha seo circe her
æfyllendra eahtnesse bad
under hæthenra hyrda gewealdum,
thær tha synsceathan sothes ne giemdon,
gæstes thearfe, ac hi godes tempel
bræcan ond bærndon, blodgyte worhtan,
feodan ond fyldon: hwæthre forth bicwom
thurh gæstes giefe godes thegna blæd
æfter upstige ecan dryhtnes,
bi thon Salamon song, sunu Dauides,
giedda gearosnottor gæstgerynum
waldend wertheoda, ond thæt word acwæth.

(*Crist*, 691-714).

C.

Tha tha Emilius Orestes wæs consul, Ethna fyr afleow up swa brad ond swa micel thætte feawe men thara monna mehten beon eardfæste, the on Lipare wæron thæm iglande, the thær nihst wæs, for thære hæte ond for thæm stence; ge ealle tha clifu the neah thæm sæ wæron forburnan to ascan; ond ealle tha scipu formulton the neah thæm sæ færende wæron, ge ealle tha fiscas the on thæm sæ wæron acwelan for thære hæte. (*Orosius*, v. 4).

Tha tha Marcus Flaccus wæs consul, comon gærstapan on Affrice, ond ælc wuht forscurfon thæs the on thæm lande wæs weaxendes ond growendes. Æfter thæm com an wind, ond forbleow hie ut on sæ. Æfter thæm the hie adruncne wæron, hie wearp seo sæ up, ond siththan mæst eall forwearth thæt on thæm lande wæs, ge monna ge nietena, ge wildeora for thæm stence. (*Orosius*, v. 4).

Hio tha Cleopatra het adelfan hiere byrgenne, ond thæroinnan eode. Tha heo thæron gelegen wæs, tha het hio niman ipnalis tha nædran, ond don to hiere earme, thæt hio hie abite; for thon the hiere thuhte thæt hit on thæm lime unsarast wære, for thon the thære nædran gecynd is thæt ælc uht thæs the hio abitt scel his lif on slæpe geendian. Ond hio thæt for thæm dyde the hio nolde thæt hie mon drife beforan thæm triumphan with Rome weard. Tha Antonius geseah thæt hio hie to deathe gerede tha ofsticade he hiene selfne, ond bebead thæt hiene mon on tha ilcan byrgenne to hiere swa somcucre alegde. Tha Octavianus thider com, tha het he niman othres cynnes nædran, vissillus is haten, sio mæg ateon ælces cynnes ator ut of men, gif hie mon tidlice to bringth. Ac hie wæs gefaren ær he hider come. (*Orosius*, v. 13).

B.A. HONOURS IN ENGLISH AND HISTORY.

EARLY ENGLISH.

THURSDAY, APRIL 5TH:—MORNING, 10.30 TO 12.

1. Translate:—

(*a*) That hym mas strength & fayrnes tyne,
Als grete stormes dose a flour to dwyne.

(*b*) For God ordayns here, als es his wille,
Sere variaunce, for certayn skille,
Of the tyms, and wedirs, and sesons.

(*c*) The world here who-so wille
Vn-to four thinges may liken by skill. (Mention the four.)

(*d*) And thare he made his moné playne.

(*e*) The King als of Nauerne,
War faire feld in the ferene,
Thaire heuiddes forto hide.

(*f*) Mekill pride was thare in prese,
Both on pencell and on plate,
When the bare rade with-outin rese
Vnto Cane the graythest gate.

(*g*) The child than darked in his den.dernly him one,
& was a big bold barn. & breme of his age,
For spakly speke it couthe tho. & spedeliche to-wawe.

(*h*) With perry & pellure, pertelyche to the rizttes.
(*i*) he wold, zif he mizt,
Wayte hire sum wicked torn. what bitidde after.
& as bliue, boute bod. he braydes to the quene.
(*j*) Those wern men methelez, & mazty on vrthe,
That for her lodlych laykez. alosed thay were.
He watz famed for fre. that fezt loued best,
& ay the bigest in bale, the best watz halden.
(*k*) Wyrk wonez therinne, for wylde & for tame,
& thenne cleme hit with clay. comly with-inne,
& alle the endentur dryuen. daube with-outen.
(*l*) The arc houen watz on hyze, with hurlande gotez,
Kest to kythez vncouthe. the clowdez ful nere,
Hit waltered on the wylde flod. went as hit lyste,
Drof vpon the depe dam. in daunger hit semed,
With-outen mast, other myke. other myry bawelyne,
Kable, other capstan. to clyppe to her ankrez,
Hurrok, other hande-heime. hasped on rother,
Other any sweande sayl. to seche after hauen,
Bot flote forthe with the flyt. of the felle wyndez;
Wheder-warde so the water. wafte, hit rebounde.
(*m*) Then vche a segge sez wel. that synk hym byhoued;
Frendez fellen in-fere & fathmed togeder,
To dryz her delful deystyné. & dyzen alle samen.
(*n*) That watz the syngne of sauyté. that sende hem oure lorde,
& the saztlyng of hym-self. with tho sely bestez,
Then watz ther ioy in that gyn. where Iumpred er dryzed,
& much comfort in that cofer. that watz clay-daubed.
(*o*) If any schalke to be schent, wer schowued ther-inne,
Thaz he bode in that bothem. brotheiy a monyth,
He most ay lyue in that loze, in losyng euer-more.
(*p*) Whon alle tresour is I-trized. Treuthe is the Beste;
I do hit on *Deus Caritas*. to deeme the sothe,
Hit is as derworthe a drurie. as deore god him-selven
For hose is trewe of his tonge. telleth not elles.
(*q*) For the same Mesure that ze Meten. Amis other elles.
(*r*) And Concience to the Kyng. Carpede hit aftur.
(*s*) Thenne lauzten thei leue, this lordynges, at Meede.
(*t*) And recheth thorw Regratorie. & Rentes hem buggeth.
(*u*) For sum tyme I Seruede. Simme atte noke.
(*v*) I Bouhte hire Barly. heo breuh hit to sulle;
Peni-Ale and piriuhit, heo pourede togedere
For laborers and louh folk, that liuen be hem-seluen,
The Beste in the Bed-chaumbre. lay bi the wowe,
Hose Bummede therof. Bouzte hit ther-after.

(*w*) He menyt thame quhen he thaim saw,
And said, eftir a litill thraw,
That he suld wenge in hy thar blude
Bot othir wayis the gammyn zude.
(*x*) That he arest rycht thair vald ma
(*y*) quhill that thai saw
Thar tym, and bryng hym than of daw
(*z*) cummynge down as a culuere
(*a*) zifa ys yfroted & yhat, a holdeth what hym neyzheth.

2. Give a brief outline of the extract from which (*d*) is taken.
3. Give an outline of,
(*a*) The Man of Lawes Tale,
(*b*) The first tale in the extracts from Gower.
(*Do not exceed a page in either case.*)
4. Name the dialects in which the extracts you have read are written, and mention *six* fundamental differences between the Northern and Southern dialects.

(*N.B.—Z = older c, g, h or s, as the case may be.*)

B.A. HONOURS IN ENGLISH AND HISTORY.

MŒSO-GOTHIC.

TUESDAY, APRIL 10TH:—AFTERNOON, 2 TO 4.

A.

1. Mention the stems of the strong nouns in Mœso-Gothic. Give the genitive singular of one noun of each stem.

2. Decline (*a*) *midjis* in all genders (strong forms only); (*b*) *blinds* in all genders (weak forms only); (*c*) *ainshun*; (*d*) *hwarjizuh*.

3. Decline (*a*) the present and past participles of *giban* (all forms;) (*b*) *thu* (all forms).

4. Conjugate (*a*) the present and past subjunctive of *wisan*; (*b*) the present subjunctive of *frijon*; (*c*) the past subjunctive of *afdumbnan*.

5. (*a*) Give the equivalents of the Indo-European vowels and diphthongs in Teutonic.
(*b*) Illustrate Mœso-Gothic ablaut (verbs only) from (*a*).

6. State in tabular form, with an illustration of each, leading phenomena in English (Anglo-Saxon) which are explained by Mœso-Gothic.

B.

1. Translate literally :—

(*a*) dage fidwor tiguns *fraisans*.
(*b*) thahai, jah *usgagg* ut us thamma.
(*c*) hwo so laiseino so niujo.
(*d*) ei jah jainar *merjau* unte duthe *kwam*.
(*e*) jah *atbair* fram gahraineinai theinai thatei *anabauth* Moses.
(*f*) *hafanana* fram fidworim.
(*g*) *insailidedun* that badi jah fralailotun.
(*h*) ibai *ofnimai* fullon af thamma sa ninja thamma fairnjin.
(*i*) thiuth *taujan* aiththau unthiuth taujau.
(*j*) allata afletada thata frawaurhte sunum manne.
(*k*) sunnin than *urrinnandin*.
(*l*) bi thata anthar lustjus.
(*m*) *biswara* thuk bi gutha ni *balwjais* mis !
(*n*) rann so hairda and driuson in marein.
(*o*) thiswaduh thei gaggaith in gard.

2. Give the principal parts of the verbs in italics.

3. Translate :—

Jah galaith in gard this synagogafadis, jah gasahw auhjodi jah gretandans jah waifairhwjandans filu.

Jah inn atgaggands kwath du im : hwa auhjoth jah gretith ? thata barn ni gadauthnoda, ak slepith.

Jah bihlohun ina. Ith is uswairpands allaim ganimith attin this barnis jah aithein jah thans mith sis, jah galaith inn tharei was thata barn ligando.

Jah fairgraip bi handau thata barn kwathuh du izai : taleitha kumei thatei ist gaskeirith : mawilo, du thus kwitha : urreis.

Jah suns urrais so mawi jah iddja ; was auk jere twalibe ; jah usgeisnodedun faurhtein mikilai.

Jah anabauth im filu ei manna ni funthi thata ; jah haihait izai giban matjan.

B.A HONOURS IN ENGLISH AND HISTORY.

More, *Utopia* ; Matthew Arnold, *Essays in Criticism* (Second Series).

Wednesday, April 11th :- Morning, 9 to 12.

1. Of what special knowledge either of literature or of life was More possessed which would fit him for writing such a satire as Utopia ?

2. What writers since More's time have written of Ideal Commonwealths? Give titles of books and approximate dates of appearance.

3. Explain briefly the Utopian position with regard to hunting, the use of gold, travel, slavery, war, education, religion. Note any points of weakness in the ideas involved.

4. Make short etymological and explanatory notes on the following: Mythra, Hythlodaye, Anyder, Anemolians, Amaurote.

5. Robinson, the first translator of Utopia, speaks of it as "A fruteful and pleasaunt worke." Justify or controvert his opinion in a brief criticism.

6. Make a brief categorical outline of the essay on The Study of Poetry.

7. (*a*) In what rank as a poet does Arnold place Gray? (*b*) Give the explanations offered by Bonstetten, by Sainte-Beuve and by Arnold himself for the scantiness of Gray's production.

8. Give the substance of Arnold's remarks on Tolstoi's religion, and where it is set forth.

9. In what, to Arnold, consists the greatest value of Milton, of Wordsworth, of Shelley and of Amiel? State in each case his points of disagreement with earlier critics where these are mentioned.

10. To whom do the following apply?—

(*a*) The moment he reflects he is a child, says Goethe.

(*b*) He is the scantiest and palest of classics in our poetry, but he is a classic.

(*c*) In one important point he was like neither a Pythagorean nor an angel.

(*d*) When the year 1900 is turned and our nation comes to recount our poetic glories in the century which has then just ended, the first names with her will be these.

11. "Magic of style is creative." Develop the idea and illustrate by reference to Arnold himself.

B.A. HONOURS IN ENGLISH LANGUAGE, LITERATURE AND HISTORY.

ENGLISH LITERATURE: *Pope.*

WEDNESDAY, APRIL 18TH:—MORNING, 9 TO 12.

1. Give some idea of Pope's indebtedness to Horace, to Boileau, and to Roscommon, as manifested in *An Essay on Criticism.*

2. Make notes on: Pope's use of the word *wit*, the free couplet, the pointed couplet, Pope's conception of "Nature," the dregs of bold Socinus, the alleged *correctness* of Pope.

3. In how far may *An Essay on Criticism* be considered original?

4. M. Lanson declares that "la raison directrice et dominatrice de l'âme humaine" determined the character of literary work in both England and France, during the last thirty years of the seventeenth century. Explain fully the meaning of this, and quote in support of your answer.

5. Discuss the principal positions taken up by Pope in support of *Deism*: and explain the causes of incoherence in his argument.

6. Give the designation of each of the divisions of *An Essay on Man*; state and discuss the steps by which Pope seeks to prove that "self-love and social are the same"; and examine the statement, "Reason the card, but Passion is the gale."

7. Give, from the poems studied, examples of each of the following:—False rhymes, false antitheses or comparisons, confusion of thought brought about by confusion of terms, faulty constructions, precision in epithet.

8. State the context of each of the following verses, and comment on the meaning:—

(*a*) And snatch a grace beyond the reach of art.

(*b*) For works may have more wit than does 'em good.

(*c*) With sure returns of still expected rhymes.

(*d*) We first endure, then pity, then embrace.

(*e*) Th' enormous faith of many made for one.

(*f*) And heav'n beholds its image in his breast.

B.A. HONOURS IN ENGLISH AND HISTORY.

SHAKESPERE: *Love's Labour's Lost; A Misdummer Night's Dream; Hamlet; The Tempest.*

FRIDAY, APRIL 20TH:—MORNING, 9 TO 12.

1. Draw an outline map of Shakspere's London, and mark on it the position of (*a*) the Theatre, (*b*) Paris Garden, (*c*) Baynard's Castle, (*d*) Alsatia. What bear does Shakespere name? Make a brief note on Shottery, the Weir Brake, Charlecote and Mary Arden.

2. What court office did Guevara hold? Name the one chief characteristic of his writing with regard to (*a*) manner, (*b*) matter. Name the work of his which is said to have particularly influenced English.

3. (*a*) State the conditions of the edict of the King of Navarre.

(*b*) State where and by whom the following are mentioned: Queen Guinever of Britain, Samson, Zenelophon, Mantuan, Saint Denis to Saint Cupid!

4. Give an outline of the scene in which the Princess sends Boyet to the King of Navarre, and end with his return.

5. (*a*) On what grounds is the *Dream* regarded as having been written to celebrate the wedding of William Stanley, Earl of Derby?

(*b*) Treat contemporaneously in Oberon's vision (*a*) a mermaid on a dolphin's back, (*b*) certain stars, (*c*) the cold moon and the earth, (*d*) Cupid, (*e*) a little western flower. Connect (*c*) and (*e*) with Lyly's *Endymion*.

6. Give an outline of that portion of Greene's *History of James IV., slain at Flodden*, which bears upon the *Dream*. Mention *one* circumstance affecting Oberon in *Huon of Bordeaux*.

7. State by whom and to whom the following lines are spoken:

(*a*) Brief as the lightning in the collied night

(*b*) O me! you juggler! you canker-blossom

(*c*) I am a spirit of no common rate

(*d*) "Ninus' tomb," man

(*e*) Such tricks hath strong imagination

8. Write pointedly and within the limit of a page, on elves in Teutonic folklore, and apply to Shakspere.

9. (*a*) How have Hamlet, Claudius and the young Hamlet been viewed with regard to the strife between Catholicism and the Reformation?

(*b*) Make a brief note on the German Hamlet, and state briefly four of the most important matters to which you would draw attention when speaking of Quarto of 1603.

10. Classify Hamlet's monologues, and give the substance of the monologue beginning with:

How all occasions do inform against me.

11. Give the meaning of escoted, mazzard, partisan, scrimers, sliver, and state where they occur, naming the speaker when you can.

12. (*a*) In Jacob Ayrer's play who correspond to Miranda, Ferdinand, Alonso? (*b*) Make a note on the locality of the island. (*c*) on two interpretations of the name *Caliban*.

13. Write a page on Caliban as revealed in the play.

14. Give the meanings of the following words, and state where they occur, naming the speaker when you can: gaberdine, ling, forth rights, trash, stover.

15. Give an outline of any important scene in any of the four plays, *or*, confining yourself to one play, discuss critically or esthetically any features which are clearly of moment. [Limit your answer to a page if possible.]

B.A. HONOURS IN ENGLISH AND HISTORY.

TENNYSON: *Idylls of the King.*

SATURDAY, APRIL 21ST:—AFTERNOON, 2 TO 5.

1. (*a*) State and explain the two aspects in which, according to Bedivere, Arthur is regarded.

(*b*) How does Tennyson differ from his sources with regard to the giving of Guinivere and the sending for her?

2. (*a*) What details of Malory's account of the combat with the red and the blue knight were given?

(*b*) Briefly show that Tennyson's list of occurrences at Arthur's court is original. How does his version of the combat with Lancelot differ from Malory's?

(*c*) What features of Tennyson's poetry do the following lines illustrate?

(*a*) Tumbled it: oilily bubbled up the mere

(*b*) Her own true Gareth was too princely-proud

(*c*) Round as the red eye of an Eagle-owl.

Refer to their places in the poem.

(*d*) What was seen in the "narrow comb"?

3. (*a*) Name the chief source of *Geraint and Enid*; also another which Tennyson may have used, with a possible proof thereof.

(*b*) Briefly state what is peculiar to Tennyson's treatment of

(*a*) the cause of departure from the court

(*b*) the ruin of Yniol's house

(*c*) the personality of the nephew

(*d*) the insult done Geraint

(*e*) the combat of Geraint with the th ee knights.

(*c*) Refer the following lines to their places in the poem :

(*a*) And never yet, since high in Paradise
O'er the four rivers the first roses blew,
Came purer pleasure unto mortal kind

(*b*) "Your sweet faces make good fellows fools"

(*c*) O, purblind race of miserable men

(*d*) In silver tissue talking things of state

(*e*) For man is man and master of his fate

4. (*a*) *Balin and Balan.* Describe the garden-scene between Guinivere and Lancelot.

(*b*) State very briefly what was said regarding the following matters in Malory : Balin and the Lady of the Lake ; the combat with Garlon ; the dolorous stroke.

5. (*a*) What do you know concerning the magic fountain in *Merlin and Vivian?*

(*b*) Refer the following lines to their places in the poem :

(*a*) All fighting for a woman on the sea

(*b*) My father died in battle against the King

(*c*) Moaning and calling out of other lands

(*d*) And like a silver shadow slipt away

(*e*) Turn'd to her : "Here are snakes within the grass."

6. (*a*) What fact in the early history of the Grail does Tennyson omit? Give the name of the Grail castle in Wolfram and of the sick King, and state the parentage of the hero of Wolfram's poem. Why was his quest so prolonged?

(*b*) Describe the experience of Sir Bors.

7. Give the substance of the dialogue between Pelleas and Gawain when Gawain looses Pelleas from his bonds.

8. (*a*) Of what does Tristram appear as the champion in Tennyson? Quote a line or two to the point.

(*b*) How does Dagonet describe the fountain and what is Tristram's reply?

9. Quote the Arthurian creed as set forth in *Guinivere or* any piece of about the same length in that poem.

HONOURS IN HISTORY.

THIRD AND FOURTH YEARS.—(*First Paper.*)

SATURDAY, MARCH 31ST:—AFTERNOON, 2 TO 5.

1. Draw up as strong an indictment of the Middle Ages as you can, looking at that period from the standpoint (*a*) of the Italian Humanists and (*b*) of the Northern Reformers. Support your points, wherever possible, by illustrations.

2. Describe:—

(*a*) the spiritual development of St. Augustine;

(*b*) his principal controversies;

(*c*) his influence on theological thought in the 16th century.

3. Was there a twelfth century Renascence?

4. (*a*) Divide mediaeval towns into categories according to origin.

(*b*) What general conditions combined to produce the communa movement of northern France?

(*c*) Examine the constitutional history of Cambrai *or* St. Quentin.

5. Through what stages did the political life of Florence pass between 1248 and the reforms of Gian della Bella?

6. (*a*) Connect the *Divina Commedia* with the *Vita Nuova.*

(*b*) Give a topographical account of the Inferno, and follow the progress of the two poets through it.

7. Write short, clear comments on: Pelayo; *domini canes;* Casentino; Monte Alverno; Gerald of Wales and Walter Map; Villani's visit to Rome; Sordello; Buondelmonti; Can Grande della Scala; Hermandad.

HONOURS IN HISTORY.

THIRD AND FOURTH YEARS.—(*Second Paper.*)

THURSDAY, APRIL 12TH :—AFTERNOON, 2 TO 5.

1. (*a*) What tendencies are revealed by the contest between Philip the Fair and the Papacy?

(*b*) With what weapons was the duel waged by the French court?

2. (*a*) How did the Avignonese residence of the Papacy tend to produce the Lollard movement?

(*b*) Explain Wyclif's attitude as a religious politician.

3. To what causes did Petrarch owe his European reputation?

4. Show fully the closeness of the relations which existed between Constantinople and Italy, 1396-1453. Establish this connection through private individuals and official intercourse.

5. Indicate the place of the following masters in the history of art:—

(*a*) Giotto;
(*b*) Brunelleschi;
(*c*) Donatello;
(*d*) Luca della Robbia;
(*e*) Masaccio.

6. Enumerate the great incidents of the Hundred Years' War and divide them into periods. Give that struggle its perspective in the rivalries of France and England.

7. Write short, clear comments on Machiavelli's divisions of Florentine history; Celestine V.; Fraticelli; Jacques du Molay; St Catherine of Sienna; Leontius Pilatus; Sforziad; *Defensor Pacis;* the competition for the doors of S. Giovanni; Ghiberti's chronology.

HONOURS IN HISTORY.

THIRD AND FOURTH YEARS.—(*Third Paper.*)

MONDAY, APRIL 16TH :—MORNING, 9 TO 12.

1. What main differences of tone do you observe between the Italian and the Northern Renascence? Give examples of contrasted types where you can.

2. How was the course of the Italian Renascence affected by political conditions?

3. Explain the nature of the part which Italians took in geographical discovery during the Renascence.

4. What distinct phases of the Renascence papacy are represented by Nicholas V., Sixtus IV. and Alexander VI.?

5. Estimate the importance, and describe the fortunes of the Duchy of Milan during the Renascence.

6. Follow Luther's development as a revolutionist from 1517 to 1521, dwelling on the main features of his career during the same period.

7. Write short, clear comments on: John Wessel; *credentes et perfecti;* the *Laus Stultitiae;* Lucas Cranach; Djem; Pius II. and his crusade; *Speculum hujus vitae;* the battle of Fornovo; the territorial extent of the papacy under Julius II.

HONOURS IN HISTORY.

THIRD AND FOURTH YEARS.—(*Fourth Paper*).

FRIDAY, APRIL 13TH:—AFTERNOON, 2 TO 4.

1. How does Poggio describe the death of Jerome of Prague?

2. How was the value of Cellini's "Perseus" fixed?

3. What advice did Lorenzo de' Medici give his son Giovanni when the latter was made a cardinal?

4 State Machiavelli's views concerning the binding force of a prince's promise.

5. What does Wimpheling say concerning:

(*a*) the study of Greek;

(*b*) the aim of grammatical instruction?

6. Outline any one of the *Epistolae Obscurorum Virorum.*

7. Write an epitome of what Butzbach says regarding Deventer and its school.

MENTAL AND MORAL PHILOSOPHY.

INTERMEDIATE EXAMINATION.

FORMAL LOGIC.

TUESDAY, APRIL 17TH:—MORNING, 9 TO 12.

(N.B.—*Write answers to A and B in separate books.*)

A.

1. Distinguish Logic from Psychology. Can Logic be correctly described as (*a*) The Science of Sciences,
(*b*) An Art?

2. Write notes on the following, giving examples:

The Relation between Denotation (Extension) and Connotation (Intension).

Collective Use of Terms.

Equivocation of Terms arising from Logical Transfer of Meaning.

Specific Difference.

Cross Division.

Constructive Dilemma

3. (*a*) If Proposition I be true, what can be known as to the truth or falsity of A, E, and O, respectively?

(*b*) Convert the following, and give the contradictory of the converse:
All good citizens are in favor of the war.

4. Define "Syllogism" per genus et differentiam, and show that in your definition no rule of definition is broken.

5. For what kinds of reasoning are the Second and Third Figures best adapted? State any other characteristics of these Figures known to you. Illustrate your answer.

B.

6. Construct a syllogism (with terms, not with symbols) in any mood of the Fourth Figure, and reduce it.

7. Write notes on: Modus Tollens, Fallacy of Division, Post hoc ergo propter hoc, Argumentum ad Hominem. Give an illustration (preferably original) of each.

8. Test the following examples:

(*a*) Soc. Do you mean to say that the art of the rhapsode and of the general is the same?

Ion. Yes, one and the same.

Soc. Then he who is a good rhapsode is also a good general?

Ion. Certainly, Socrates.

Soc. And he who is a good general is also a good rhapsode?

Ion. No; I don't say that.

Plato.

(*b*) That which is not just is not law; and that which is not law ought not to be obeyed.

Algernon Sidney.

(*c*) Such as causes are, such must be their effects. And therefore as natural Affection or social Love is perfect or imperfect; so must be the Content or Happiness depending on it.

Shaftesbury.

(*d*) The cost of labour depends on the efficiency of labour;
The rate of profits depends on the cost of labour;
The investment of capital depends on the rate of profits;
Wages depend on the investment of capital;
Therefore, wages depend on the efficiency of labour.

Carveth Read's Summary of J. S. Mill.

THIRD YEAR SESSIONAL EXAMINATION.

MURRAY'S HANDBOOK OF PSYCHOLOGY, BOOK II., PART I.

WEDNESDAY, APRIL 11TH:—MORNING, 9 TO 12.

Answer only eight questions.

1. Define the terms—Perception, Abstraction, Generalization, Denomination, Conception, Judgment, Reasoning, Idealisation.

2. Compare the intellectual value of tastes with that of odours.

3. Give an account of the principal perceptions *either* of touch *or* of hearing.

4. Describe the defects of visual perception experienced by persons born blind when restored to sight.

5. Explain the illusion referred to in the following couplet :—

"At times the small black fly upon the pane
May seem the black ox on the distant plain."

6. What is attention? When is it voluntary; when involuntary?

7. Show that knowledge does not begin either with individualisation or with generalisation, but that it advances towards both.

8. Explain the interdependence of thought and language.

9. Describe fully the different ideals of intelligence.

10. Distinguish hallucinations, illusions and fallacies; and explain briefly the distinctive characteristics of dreaming.

11. Distinguish Empiricism and Idealism.

12. What is meant by the relativity of knowledge?

B.A. ORDINARY.

MURRAY'S INTRODUCTION TO ETHICS, BOOK II.

TUESDAY, APRIL 3RD:—MORNING, 9 TO 12.

Answer only eight questions.

1. Explain fully the general problem of Ethics Proper, as distinguished from the Psychology of Ethics.

2. Give an outline of Utilitarianism.

3. "The attempt to establish an absolute coincidence between virtue and happiness is in ethics what the attempting to square the circle or to discover perpetual motion are in Geometry and Mechanics. I think it better frankly to abandon the hopeless endeavour." (*Leslie Stephen.*) Discuss the legitimacy of such a comparison as a defence of Utilitarianism.

4. Give an account of ancient Stoicism *or* of any modern ethical system of the Stoical type.

5. How far does the uncertainty of speculative moral theories affect the practical problems of morals?

6. Distinguish (*a*) Legal and Moral, (*b*) Personal and Social, (*c*) Determinate and Indeterminate, Obligations.

7. Explain the right of freedom, and show that, so far from being opposed to, it is really identical with, social order.

8. How far has the labourer attained in reality that freedom of contract, which in the theory of our laws he is assumed to possess?

9. Discuss the questions which have been raised in regard to the obligation of truthfulness.

10. Distinguish (*a*) Virtue from Duty, (*b*) the three aspects of Virtue.

11. Explain Virtue as an emotional habit, *either* in its negative *or* in its positive aspect.

12. Describe the special disciplines required for training the will.

THIRD YEAR HONOURS IN MENTAL AND MORAL PHILOSOPHY.

GREEK PHILOSOPHY.

SATURDAY, APRIL 14TH:—MORNING, 9 TO 12.

Answer five questions from A. and three from B. Write answers to A. and B. in separate books.

A.

1. Tell what you know of one of the Ionic philosophers.

2. Give a sketch of the Pythagorean philosophy.

3. Compare the doctrines of Empedokles, of Demokritos and of Anaxagoras with regard to the elements of things.

4. Give a brief account of the life of Sokrates, describing his method of teaching.

5. Explain the general character of the Cyrenaic School, and note the special features in the teaching of Annikeris, Hegesias and Theodoros respectively.

6. Give an outline of the Stoical *or* of the Epicurean Ethics.

7. Write a note on any two of the following:—Pyrrho, Timon, Arkesilaos, Karneades, Sextus Empiricus.

B.

1. "Aristotle codified Plato." "The obstrusive difference in manner should not make us blind to the essential agreement in the thought of Plato and Aristotle." Discuss these statements.

2. What is the main significance of the mythical element in Plato's philosophy? Illustrate from the Myth of Reminiscence and the Allegory of the Cave-dwellers.

3. Examine the relation between Ethics and Politics as shown in the Republic of Plato. Is this relation maintained by Aristotle?

4. In what sense is it true that the scientific spirit and method originated with Aristotle?

5. (*a*) "In Aristotle *νόμος* is the *φύσις* of man." Consider Aristotle's conception of the state in reference to this view.

or

(*b*) Show how the idea of performance of function influenced the moral philosophy of Plato and Aristotle.

THIRD YEAR HONOURS IN MENTAL AND MORAL PHILOSOPHY.

LOGIC.

THE THEORY OF KNOWLEDGE WITH PLATO'S THEÆTETUS.

FRIDAY, APRIL 20TH:—MORNING, 9 TO 12.

Answer five Questions out of A and three out of B.

A.

1. "Thought is a relational activity." Explain this, and show what kind of relation is at the basis of syllogistic reasoning.

2. "The syllogism is a Procrustean bed." Is this a fair criticism? What, in the attitude of formal logicians, has given rise to it?

3. How is the postulate of knowledge that the world is rational brought out in the theories of Plato and Aristotle?

4. Comment on any *four* of the following:

(*a*) Aristotle's saying that "In a certain sense mind is the objects known."

(β) The "Inconceivability of the Opposite" as a test of truth.

(γ) The Categories of Aristotle.

(δ) Aristotle's distinction between the Matter and the Form of Thought.

(ε) Kant's distinction between the Receptivity and the Spontaneity of Intelligence.

(η) Lotze's distinction between the Coincident and the Coherent.

(θ) The Law of Inverse Ratio between Extension and Intension.

5. Discuss the view that Thought is a Unity in all its processes, showing the form it takes in Plato and Kant.

6. What are the essential characteristics of thought? Are these present in the concept?

7. Write notes on the mental acts involved in the formation of the concept.

8 What is the relation of the judgment to a fully expressed inference?

B.

1. What is the main problem of the Theory of Knowledge? What shape does it assume in the Theætetus?

2. Comment on the following:

(*a*) The Image of the Cage of Birds.

(*b*) "Knowledge is not in the impressions of sense, but only in our reasonings about them."

(*c*) "We see not with, but through the senses."

3. Compare Plato's treatment of the Problem of Knowledge in the Theætetus with that of the Ideal Theory.

4. What light is thrown on the question of the requisites of Knowledge by the discussions of the definitions:

(1) Knowledge is sensible perception.

(2) Knowledge is true opinion with right reason.

5. Does the doctrine "Man is the Measure" inevitably lead to philosophical scepticism?

THIRD YEAR HONOURS IN MENTAL AND MORAL PHILOSOPHY

JAMES' PRINCIPLES OF PSYCHOLOGY,

AND

FRASER'S SELECTIONS FROM BERKELEY.

WEDNESDAY, APRIL 18TH :—MORNING, 9 TO 12.

Answer five questions from A., and three from B.

A.

1. What is a man's Self in its widest possible sense, and what are its constituents ?

2. Describe *either* the different kinds of attention *or* the effects of attention on reaction time.

3. Explain James' Conceptualism.

4. Explain the causes by which discrimination is improved.

5. Explain the Law of Redintegration.

6. Show that we have no sense for empty time, and that our estimate of times varies.

7. Wherein does all improvement of memory consist ?

B.

1. Show how Berkeley's theory of abstract ideas is logically connected with his theory of the material world.

2. State any two of the objections to his doctrine that are discussed in "The Principles of Human Knowledge," and give Berkeley's replies.

3. Explain Berkeley's doctrine, that God speaks to us as truly as we speak to one another.

4. Write a note on "Siris."

B.A. HONOURS IN MENTAL AND MORAL PHILOSOPHY.

ZELLER'S STOICS, EPICUREANS AND SCEPTICS.

FRIDAY, MARCH 30TH :—AFTERNOON, 2 TO 5.

Answer only six questions.

1. Describe the tendencies of post-Aristotelian Philosophy and the influences to which they were due.

2. Tell what you know about the history *either* of the Stoics *or* of the Epicureans.

3. Sketch the Stoical Ethics both in its theoretical and in its practical aspects.

4. Give an outline of the Stoical Theology.

5 Sketch *either* the Stoical Theory of Knowledge *or* the Epicurean Canonic.

6. Explain the Atomism of the Epicureans.

7. Give an outline of the Epicurean Ethics.

8. Describe the Scepticism of Pyrrho *or* of Timon.

9. Give a sketch of the New Academy.

B.A. HONOURS IN MENTAL AND MORAL PHILOSOPHY.

SPENCER, *First Principles :* MILL, *Logic, Bk. VI.*

THURSDAY, 5TH APRIL :—MORNING, 9 TO 12.

1. State clearly Spencer's conception of *The Absolute;* and criticise his application of that conception to any *one* ultimate postulate of thought.

2. A recent philosophical critic holds that Spencer's "*Transfigured Realism* is mere *phenomenalism* under a palpable disguise." Discuss this statement.

3. Explain fully : Dissolution as the correlate of evolution, the rhythmical law of motion, the persistence of force. Use *original* illustrations.

4. How does Spencer apply the Law of Evolution to the growth and development of Language ?

5. Summarize Mill's position regarding the question of Moral Liberty.

6. Criticise carefully the conception of "Mental Chemistry" as explanatory of psychic processes and facts.

7. Discuss fully, with *original* illustrations, the value of verification in the study of sociology.

B.A. HONOURS IN MENTAL AND MORAL PHILOSOPHY,

MAINE'S ANCIENT LAW.

TUESDAY, APRIL 10TH:—AFTERNOON, 2 TO 5.

(*Answer only seven questions*)

1. Write notes on Legal Fictions, Equity and Legislation, and distinguish between Themis and Themistes.

2. What is a Law of Nature, and how is it related to Modern International Law?

3. Discuss the legal status of women in primitive society.

4. Mention the modes of acquiring property in early times.

5. Develop the idea of contract.

6. Distinguish between Agnates and Cognates, and state the effect of agnatic and cognatic relationship upon testamentary succession.

7. Write on the significance of Wills in Roman Law.

8. What effect had the fact that the family, not the individual, was the unit of ancient society upon early jurisprudence; and what was its ethical import?

9. Contrast the ancient and modern conceptions of crime.

B.A. HONOURS IN MENTAL AND MORAL PHILOSOPHY.

HISTORY OF PHILOSOPHY.

THURSDAY, 12TH APRIL:—MORNING, 9 TO 12.

(*N.B.—Write answers to A. and B. in separate books.*)

A.

(*Answer only five questions.*)

1. (*a*) State your conception of the science of Sociology.

(*b*) What work that is distinctively new has been undertaken by investigators in this department of knowledge?

2. Discuss Barth's classification of Sociologists.

3. What is the fundamental idea of Comte's philosophy, and how did he evolve from that his system of Social Physics?

4. What is the significance of Ward's doctrine of Social Teleology?

5. Explain what is meant by the "Organic Concept of Society," and distinguish clearly between the views of Spencer and Small.

6. Criticize DeGreef's Schedule, and compare it with any other that may seem to you a better one.

7. Estimate the value of Spencer's contribution to Social Philosophy.

8. What is the purpose of Sociology according to (*a*) Giddings, (*b*) Ward?

B.

1. Professor James says of Hartley, "I believe that he was, in many essential respects, on the right track." Discuss this fully and carefully.

2. State clearly Rousseau's doctrine of the *Social Contract*, trace its origin, and its influence on any English political writer of the last century; and give a *résumé* of Paley's destructive criticism of it.

3. Make notes on:—Godwin's radicalism in social matters, the mercantile theory of the origin of wealth, Bentham's theory of legal punishment, the idealism of Coleridge.

4. Give an account of the psychological law of *Association*, as received and applied by the English School of Empiricists.

5. Distinguish between the Utilitarianism of Paley and of Bentham, respectively.

B.A. HONOURS IN MENTAL AND MORAL PHILOSOPHY.

JAMES' PRINCIPLES OF PSYCHOLOGY, VOL. II.

MONDAY, APRIL 16TH:—MORNING, 9 TO 12.

Answer only eight questions.

1. Give an account of James' explanation of the Relativity of Human Knowledge.

2. Describe varieties of imagination, *or* discuss the question of the neural process in imagination.

3. Explain the perception of "things," and distinguish two kinds of illusion.

4. State and discuss *either* James' theory of the perception of space *or* the theory of "local signs."

5. Explain the nature of belief and its opposites.

6. Explain the essential characteristic of genius, and distinguish its two types.

7. Describe and illustrate two principles that interfere with the uniformity of instincts.

8. Point out the difficulty of testing James' theory of the emotions, and some of the objections to the theory.

9. What is the indispensable prerequisite of voluntary action, and what is the essential feature of willing?

10. Write a note on the controversy about freedom of the will.

11. State and discuss Spencer's theory of the effect of ancestral experience.

12. What evidence is there for the hereditary transmission of acquired habits?

B.A. HONOURS IN MENTAL AND MORAL PHILOSOPHY.

WATSON'S OUTLINE OF PHILOSOPHY.

WEDNESDAY, APRIL 18TH:—MORNING, 9 TO 12.

Answer only six questions.

1. Explain (*a*) the problem of philosophy, as distinguished from science, (*b*) the three divisions of philosphy.

2. Explain (*a*) Comte's relation to Rousseau and St. Simon, (*b*) his theory of the three stages of intellectual development, (*c*) his Agnosticism.

3. Discuss Mill's theory of Geometry.

4. Compare Watson's with Mill's theory of Cause.

5. How far is Darwinism compatible with a teleological explanation of the world?

6. Show that neither the so-called "selfish" nor the so-called "social" impulses are in reality either selfish or unselfish.

7. How does Speculative Idealism explain the distinction of subject and object?

8. Discuss Kant's opposition of inclination and duty.

9 Write a note on the problem of freedom, *or* on Kant's postulates of practical reason.

10. Explain Kant's analysis of aesthetic judgment,

B.A. HONOURS IN MENTAL AND MORAL PHILOSOPHY.

ARISTOTLE'S NICOMACHEAN ETHICS.

FRIDAY, APRIL 20TH :—MORNING, 9 TO 12.

Answer seven questions.

1. State with explanations the chief points of contrast between the general attitude of Aristotle's Ethics and that of modern moral philosophy.

2. Examine the methods of Ethics discussed and employed by Aristotle.

3. "The end of the investigation is not knowledge but action." Show the influence of this conception of the subject on the spirit of the Ethics.

4. Discuss Kant's Criticism that in the "Doctrine of the Mean" Aristotle gives only a quantitative test of virtue. How is this doctrine related to the history of Greek thought?

5. "The discussion of the will in the Ethics is not metaphysical and rarely psychological." Examine this statement, and give some account of Aristotle's investigation into the nature of the voluntary and the involuntary.

6. How does Aristotle classify the forms of "Particular Justice"? What elements does he supply towards theories of:

(1) A division of Property.
(2) Punishment.
(3) Political Economy.

7. Give an account of:

(1) Equity (ἐπιείκεια),
(2) The Practical Syllogism,

stating your opinion as to the value of the latter in moral theory.

8. Consider the grounds of Aristotle's classification of the Virtues into Moral and Intellectual, and the reasons he gives for a treatment of the Intellectual Virtues.

9. Discuss the treatment of Practical Wisdom (*φρόνησις*).

10. Compare the Aristotelian with the Platonic doctrine of Pleasure. Is there any ground for the criticism that Aristotle is a Hedonist?

11. Mention the elements of sociological and political theory furnished in the books on Friendship. How does Aristotle apply the doctrine of *ἐνέργεια* in these books?

12. What are the different conceptions of the ideal life presented in the Ethics? Which of them do you consider most in harmony with modern moral ideas?

B.A. HONOURS IN MENTAL AND MORAL PHILOSOPHY.

THE PHILOSOPHY OF KANT.

MONDAY, APRIL 23RD:—MORNING, 9 TO 12.

Answer only eight questions.

1. Explain the drift of each of Kant's three Critiques.

2. How does Kant answer the problem of pure reason in the Transcendental Aesthetic?

3. Distinguish the two parts of the Transcendental Logic.

4. How does Kant explain the threefold division running through the table of the Categories?

5. State the Analogies of Experience, and show their connection with the Categories from which they are derived.

6. Distinguish Phenomenon and Noumenon.

7. Explain the process by which each of the Ideas of pure reason is formed.

8. Give the system of Cosmological Ideas, and state the Antinomies to which they give rise.

9. Give Kant's classification and criticism of the arguments for the existence of God.

10. Give a brief outline of the Analytic of Pure Practical Reason.

11. Wherein do the postulates of practical reason supplement the conclusions of speculative reason?

12. State and discuss Kant's solution of the antinomy involved in the teleological judgment.

SANSKRIT.

FRIDAY, MARCH 23RD:—MORNING, 9 TO 12.

1. Translate into English:

तदहं तदाज्ञया ब्रवीमि। शृणु। यदेते शशकाश्चन्द्रसरोरक्षका-
स्त्वया निःसारितास्तच्च युक्तं कृतम्। यतो रक्षकास्ते शशका
मदीया अत एव लोके मे शशाङ्क इति प्रसिद्धिः। एवमुक्तव-
ति दूते स यूथपतिर्भयादिदमाह। इदमज्ञानतः कृतम्। पुनर्न
गमिष्यामि। दूत उवाच। तदत्र सरसि भगवन्तं चन्द्रमसं प्रको-
पात्कम्पमानं प्रणम्य प्रसाद्य च गच्छ। ततस्तेन राज्ञा नीत्वा तत्र
जले चञ्चलं चन्द्रप्रतिबिम्बं दर्शयित्वा स यूथपतिः प्रणामं का-
रितः। देव। अज्ञानादेवानेनापराधः कृतस्तत्क्षम्यतामित्युक्त्वा
तेन शशकेन स यूथपतिः प्रस्थापितः। अतो ऽहं ब्रवीमि।

10 व्यपदेशेन महतां सिद्धिः संजायते परा।
शशिनो व्यपदेशेन वसन्ति शशकाः सुखम्॥

2. Give Genitive Sing.: Nom. Dual.: Instrumental Plural: and meaning of pitṛ vāc īçvara giri vadhū madhu jagat etad kartṛ tvad.

3. Give imperative passive of √ 1 dā: optative active causative of √ sthā. Parse uhyate.

4. Give rule for formation of Past Active Participle, with example from √ muc. When is the —ya gerund employed instead of the —tvā gerund? What is the syntactical value of a gerund?

5. What are the rules of saṁdhi governing —as?

6. Translate into Sanskrit :—

An old horse met a bird in a forest in the neighbourhood of a city and said to him : "where dost thou live?" The bird showed him. Then to the horse, being down-cast, the king of the birds gave wings. Then the horse flew up and visited among the gods, and they gave him nectar. That is nectar which dies not, but mixed with water it perishes. Then a poet mounted the horse. He gave him fodder but the horse did not take it. Then he gave him water to drink. The horse died. Therefore I say :—

Who drinks water he does not fly
By water even the immortal horse of the poet died.

FRENCH.

EXAMENS DE FIN D'ANNÉE.

PREMIÈRE ANNÉE,

LETTRES.

SECTION II.

MERCREDI, 11 AVRIL :—DE 9 HRES. A MIDI.

1. Décrire les origines, le développement et l'extinction de la féodalité en France,

ou

Raconter la lutte entre les Armagnacs et les Bourguignons. (500 mots environ).

2. Définir les termes : Syllabe atone. Césure. Consonne d'appui Rime Riche. Rondel. Sonnet.

3. Indiquer les grandes différences entre le latin littéraire et le latin vulgaire en montrant comment ce dernier se retrouve dans le français moderne.

4. Expliquer les tendances générales du Romantisme par le nom que porte ce mouvement littéraire.

5. Le Gendre de M. Poirier. Résumer les idées sur la noblesse que M. Poirier exprime. Scène II, Acte III.

ou

Raconter l'intrigue de la pièce.

6. A. Dumas (Impressions de Voyage). Raconter une pièce caractéristique des mœurs russes.

ou

Décrire sous forme de lettre à un ami les événements qui se sont passés à Montréal quand on a annoncé la levée du Siège de Ladysmith.

N.B.—Répondre en français exclusivement.

PREMIÈRE ANNÉE.

FRANÇAIS.

GRAMMAIRE, COMPOSITION ET TRADUCTION.

MERCREDI, 11 AVRIL :—TROIS HEURES.

1. Traduisez :

(*a*) I have never seen anything more beautiful than these rose-bushes. Some of them will die; more than one, however, will live and turn out well. I have already sent the most of the roses to the hospital, but these few will appear on our table this evening.

(*b*) We ought to have dined at our usual time, half past one ; then we should not have been obliged to hurry.—I like dining early as much as you do, but I think it was better to wait than to leave before A. had arrived. Even if it had not been fine, I should rather have left later and been a little late, than be impolite.

(*c*) I am not astonished that you doubt whether he will come. Indeed? he may even refuse to recognize that he owes me anything. I can understand his absenting himself, but I confess that I am surprised that he has not replied to my letter.

(*d*) I shall not leave until you mention the hour when you are to announce the decision. It is not that I absolutely need to know, nor do I remain in order to show that I cannot be persuaded to yield; but as I have stayed so long, I will stay, as I told you before, until I hear something positive. I think I am old enough for patience to be expected of me.

(*e*) In case he resists, we will use force, but, in spite of all the harm he has done me, I will not ill-treat him. It is true that, if he had been my own friend, I could not have done more for him.

2. Donnez les équivalents en anglais de :

(*a*) Convenir de, convenir à.

(*b*) Penser de, penser à.

(*c*) Répondre de, répondre à.

(*d*) Manquer de, manquer à.

(*e*) Échapper de, échapper à.

(*f*) Imposer (v. trans.), en imposer.

3. Tous les participes passés dans les phrases suivantes sont au masculin singulier ; corrigez, s'il y a lieu, et donnez les règles qui se rapportent à chaque exemple :

Les arbres les plus *élevé* sont les plus *exposé* aux coups de la tempête.

De tout temps les conquérants ont *causé* la ruine des nations qu'ils ont *vaincu* et de celles qu'ils ont *fait* vaincre. Combien de personnes se sont *repenti* d'avoir mal *employé* les années qu'elles ont *vécu!* Ne pas écrire correctement, c'est dévoiler le peu d'instruction qu'on a *reçu*. Démosthène, lâche dans les combats, s'est *donné* la mort, et Alexandre l'a *vu* arriver avec frayeur, lui qui l'avait tant de fois *affronté* avec témérité sur le champ de bataille.

4. Donnez cinq exemples raisonnés, représentant chacun un cas différent de l'emploi du subjonctif.

5. Mᵉˡˡᵉ de la Seiglière :

Traduisez :

Destournelles. O candeur !...O naïveté des guerriers !... Monsieur Bernard, je veux croire avec vous à la droiture du marquis, à la sincérité de l'affection qu'il vous témoigne. Vous l'amusez : c'est tout ce qu'il lui faut. Je parierais même qu'il ne sait déjà plus ce que vous êtes venu faire ici. De son côté, monsieur de Vaubert, absorbé par l'étude des trois règnes de la nature, ne se doute même pas de ce qui se passe autour de lui : c'est le privilège de la science. Mais la baronne, mon jeune ami? Vous souvient-il de l'apologue du lion amoureux?

Bernard. Eh! Monsieur, laissons là la baronne ; c'est bien de cette femme qu'il s'agit! Que Mademoiselle de la Seiglière soit heureuse; qu'elle ignore à jamais les intrigues qu'elle a servies sans s'en douter ; qu'elle continue de vivre calme, sereine, sans défiance, au milieu du luxe de ses ancêtres : voilà ce que je veux. Quant à Madame de Vaubert, elle peut triompher tout à son aise, cela m'est vraiment bien égal.

6. Faites (*a*) une esquisse biographique de Bernard et (*b*) un résumé de la situation politique et sociale en France à l'époque de la pièce.

7. Traduisez :

(*a*) Je lui serrai la main ; Mme Simons et sa fille se détournèrent avec dégoût. Elles s'obstinaient à voir en lui un complice des brigands. Le pauvre bonhomme n'avait pas tant de malice. Il ne savait que chanter ses prières, soigner ses petites bêtes, vendre sa récolte, encaisser les revenus du couvent et vivre en paix avec tout le monde. Son intelligence était bornée, sa science nulle, sa conduite innocente comme celle d'une machine bien réglée. Je ne crois pas qu'il sût distinguer clairement le bien du mal, et qu'il mît une grande différence entre un voleur et un honnête homme. Sa sagesse consistait à faire quatre repas tous les jours et à se tenir prudemment entre deux vins, comme le poisson entre deux eaux.

(*b*) J'avais donc enfin trouvé la corde sensible! Le vieux Pallicare était touché au cœur. Je savais que mon compte était bon, je n'espérais point de grâce, et pourtant j'éprouvais une amère joie à bouleverser ce masque impassible et cette figure de pierre. J'aimais à suivre dans les

sillons de son visage le mouvement convulsif de la passion comme le naufragé perdu sur une mer furieuse admire au loin la vague qui doit l'engloutir. J'étais comme le roseau pensant, que l'univers brutal écrase de sa masse, et qui se console en mourant par la conscience hautaine de sa supériorité. Je me disais avec orgueil: "Je périrai dans les tortures; mais je suis le maître de mon maître et le bourreau de mon bourreau."

8. Traduisez:

(*a*) The following story is told of the boyhood of the late Duke of Clarence. Being in want of pocket-money, he took it into his head to write boldly to the Queen, his grandmother, to beg her to send him some money. Not a penny did she send, but she wrote her grandson a long letter full of good advice. The young prince immediately saw what he could do with the royal autograph, and sold it on the spot for thirty shillings. The person who bought it did not make a bad bargain, for a few weeks ago, at a sale of autographs, this letter was sold for sixteen pounds.

(*b*) It is said that the letters Napoleon wrote to Josephine from Germany were at first taken for rough maps of the war. Perhaps the most amusing incident that ever happened occurred to Rufus Choate. He had promised to send a model for a mantelpiece, but, not being able to send what he wanted, he wrote to the workman to that effect. The carpenter eyed the missive from all sides, and finally decided that it must be the promised plan, and then and there fashioned what must have been the most curious mantelpiece ever made.

DEUXIEME ANNÉE.

LETIRES.

SECTION 2.

MERCREDI, 11 AVRIL 1900:—DE 9 HEURES A MIDI.

1. Raconter les guerres de Pépin le Bref. (500 mots environ.)

2. Ecrire une biographie sommaire de Jeanne d'Arc.

3. *Lesage.* Les Aventures de Beauchêne.

ou

Th. Gautier. Histoire de Militona. (500 mots environ.)

4. Apprécier l'œuvre de Victor Hugo, (*a*) comme poète, (*b*) comme prosateur.

5. Faire une critique du style de Georges Sand.

6. De tous les écrivains français quel est celui que vous préférez? Dites pourquoi et critiquez ce que vous connaissez de son œuvre.

7. Donnez vos idées sur l'avenir de l'Empire Britannique. (500 mots environ.)

DEUXIÈME ANNÉE.

FRANÇAIS.

TRADUCTION, SYNTAXE, LITTÉRATURE.

MERCREDI, 11 AVRIL :—TROIS HEURES.

1. Traduisez :—

During a war between Austria and Turkey, a baker kneading bread in his cellar noticed a slight noise as of a thing rising and falling at intervals, which seemed to come from a distant corner of the cellar. He stopped his work, and, tracing the sounds, discovered that they were caused by a few marbles dancing up and down on the head of a little drum his child had left there. Most people would have been satisfied to attribute the motion of the marbles to the rumbling of the vehicles in the street or to the occasional firing of guns ; but this man was an observer. Surprised at the perfect regularity with which the marbles jumped from the drum-head, he put his ear to the ground and noticed a distant tapping. He recalled how, as a boy, he had heard from one end of a long log a companion scratching with a pin upon the other end ; and he judged that the earth was just such a conductor of sound as the log had been. Suddenly it flashed upon him that what he had heard was the sound of a pick, and that the Turks were doing what had so long been feared—undermining the city. The news was carried to the Austrian general, who, after examination, prepared a countermine, which was exploded, and the Turks fled.

2. Donnez les équivalents en anglais des expressions suivantes prises des *Misérables* :

(*a*) Coucher à la belle étoile. (*b*) A cœur sec œil sec. (*c*) Une façon de gargote qui n'existe plus aujourd'hui. (*d*) Cette industrie avait toujours végété, à cause de la cherté des matières premières qui réagissait sur la main-d'œuvre. (*e*) Première esquisse de deux figures louches. (*f*) Tireuse de cartes. (*g*) L'avocat général l'envoya par un exprès à franc étrier, (*h*) A bout portant. (*i*) Ventre à terre. (*j*) Est-ce que je vais avoir la berlue? (*k*) Repris de justice qui rompt son ban. (*l*) Si vous me faites arrêter, mon camarade donnera le coup de pouce à l'Alouette. Voilà. (*m*) Le signal du branle-bas dans un équipage. (*n*) A la brume, elle descendit au jardin.

3. Traduisez :—

Si Napoléon était souvent trompé, il usait souvent aussi de ruse pour faire réussir ses projets, ainsi que le prouve la comédie diplomatico-militaire que je vais raconter, et dans laquelle je jouai mon rôle. Pour bien comprendre ceci, qui vous donnera la clef des intrigues, causes, l'année

uivante. de la guerre entre Napoléon et le roi de Prusse, il faut nous reporter à deux mois en arrière, au moment où les troupes françaises, parties des rives de l'Océan, se dirigeaient à marches forcées sur le Danube. Pour se rendre du Hanovre sur le haut Danube, le premier corps d'armée, commandé par Bernadotte, n'avait pas de chemin plus court que de passer par Anspach. Ce petit pays appartenait à la Prusse ; mais il était assez éloigné de son territoire, dont plusieurs principautés de troisième ordre le séparaient ; on l'avait toujours considéré dans les anciennes guerres comme un territoire neutre, sur lequel chaque parti pouvait passer, en payant ce qu'il prenait et en s'abstenant de toute hostilité.

4. Appliquez dans des exemples les règles de l'emploi ou de la suppression de l'article avec les noms propres, (*a*) de villes, (*b*) d'îles, (*C*) de rivières ou de fleuves, (*D*) de pays avec ou sans préposition.

5. Indiquez la différence entre : (*a*) *l'un et l'autre* et *l'un l'autre*, (*b*) *chaque* et *chacun*, (*c*) *plus* et *davantage*, (*d*) *plus tôt* et *plutôt*, (*e*) *le jour même* et *le même jour*, (*f*) *n'avez-vous pas de l'argent?* et *n'avez-vous pas d'argent?*

POUR LES ÉTUDIANTS DU COLLÈGE MCGILL.

6. (*a*) Racontez la découverte de Richard Cœur de Lion par Blondel.

(*b*) A quelle classe de poètes l'un et l'autre appartiennent-ils ?

(*c*) Quelle langue parlaient-ils ? Dites-en quelque chose.

7. Faites connaître la réforme littéraire du XVIe siècle en France, en disant quelque chose de : (*a*) celui qui en donna le signal —par quel écrit ? (*b*) son fondateur ou organisateur, (*c*) son double but, (*d*) son grand défaut.

8. Parlez brièvement du caractère et des représentants, (*a*) de l'histoire et (*b*) de la poésie dramatique en France au XVIe siècle.

POUR LES ÉTUDIANTS DES COLLÈGES AFFILIÉS.

6. (*a*) Donner un aperçu de la vie de Souvestre.

(*b*) Apprécier son œuvre *Un Philosophe sous les toits*.

7. Esquisser la vie de Pierre Loti ; décrire ses œuvres et faire une description de l'équipage dans *Les Pêcheurs d'Islande*.

8. Donner les principes de l'école romantique.

9. (*a*) Donner une esquisse de la vie de Victor Hugo.

(*b*) Apprécier son œuvre *Les Misérables*.

(*c*) Donner un portrait de l'évêque Bienvenu.

10. Donner un aperçu de la vie de Th. Gauthier.

TROISIÈME ANNÉE.

FRANÇAIS.

LE MARDI 17 AVRIL, DE 9 HEURES À MIDI.

Prière de répondre en français exclusivement et de vouloir bien se rervir d'un cahier séparé pour chacune des sections A et B.

A.

1. Enumérer les causes et les conséquences de la Révocation de l'Edit de Nantes.

2. Exposer l'origine, la marche et le résultat de la guerre de Trente ans.

3. Faire une composition de 800 à 1,000 mots sur les Expositions Universelles.

B.

4. Exposer avec quelque développement les causes qui expliquent le grand concours d'hommes éminents au XVIIe siècle.

5. Donner un aperçu de la vie et de l'œuvre de Vaugelas et de Malherbe.

6. Faire une esquisse du *Discours sur l'Histoire Universelle.*

ou

du Lutrin.

7. (*a*) Faire une analyse sommaire de *Cinna ;* (*b*) écrire une courte biographie de l'auteur, et (*c*) indiquer ses autres ouvrages.

8. Comparer le XVIIe et le XVIIIe siècle au point de vue littéraire.

9. Traduire en français :

(*a*) A fisherman, to whom this boat belonged, picked up the plate and brought it back to the governor. He, amazed, asked the fisherman : "Have you read what is written on this plate, and has any one seen it in your hands?" "I do not know how to read," replied the fisherman ; "I have just found it ; nobody has seen it." This peasant was kept until the governor was well assured that he had never read, and that the plate had not been seen by any one. "Go!" he said to him ; "you are very lucky not to know how to read." Among the persons who have had an immediate knowledge of this fact, there is one quite worthy of faith who is still living.

(*b*) A man may be a good minister and be vindictive ; it is sad that he could not be as generous as he was vigilant. One of the most implacable of Fouquet's persecutors was Michel le Tellier, then state secretary and his rival in favor ; it was the same man who was afterwards chancellor. When we read his funeral oration and compare it with his conduct what can we think, except that a funeral oration is only a declamation? But Chancellor Seguier, the president of the commission, was the one of Fouquet's judges who sought his death with most persistency, and who treated him with most harshness.

BACCALAURÉAT ÈS-LETTRES.

MARDI, LE 17 AVRIL, DE 9 HEURES A MIDI.

Prière de répondre en français exclusivement et de vouloir bien se servir d'un cahier séparé pour chacune des sections A. et B.

A.

1. Reproduire en français moderne les passages suivants :—

(*a*) Voyant que la fureur d'aucuns iniques s'étoit tant eslevée en vostre Royaume, qu'elle n'avait laissé lieu aucun à toute saine doctrine, il m'a semblé estre expedient de faire servir ce present livre, tant d'instruction à ceux que premierement j'avoye deliberé d'enseigner qu'aussi de confession de foy envers vous: dont vous cognoissiez quelle est la doctrine contre laquelle d'une telle rage furieusement sont enflambez ceux qui par feu et par glaive troublent aujourd'huy vostre Royaume.....C'est force et violence, que cruelles sentences sont prononcées à l'encontre d'icelle devant qu'elle ait esté desfendue.....Et neantmoins encores vous n'en oyez que la moindre portion.

(*b*) A CASSANDRE.

Mignonne, allons voir si la rose
Qui ce matin avait desclose
Sa robe de pourpre au soleil,
A point perdu, ceste vesprée,
Les plis de sa robe pourprée,
Et son teint au vostre pareil.
Las! voyez comme en peu d'espace,
Mignonne, elle a dessus la place,
Las! las! ses beautez laissé cheoir!
O vrayment marastre Nature,
Puisqu'une telle fleur ne dure
Que du matin jusques au soir!

2. Commenter les formes *aucuns, devant que, oyez, desclose, cheoir, dessus, icelle*, par rapport à l'usage actuel.

3. Parler de la Pléiade, (*a*) de son origine, (*b*) de son influence sur la langue et (*c*) sur la littérature.

4. De qui sont les œuvres suivantes, et quelle est leur importance littéraire :—*Cléopâtre, l'Institution de la religion chrétienne, Vies des hommes illustres, la Franciade?*

B.

5. Indiquer (*a*) les diverses époques et évolutions de la littérature française du XIXe siècle, et (*b*) les genres qui ont disparu et les nouveautés qui ont surgi pendant ce siècle.

6. (*a*) A quoi tient la supériorité des productions historiques de la Restauration? (*b*) Quelles sont les diverses écoles auxquelles se rattachent ces productions historiques? Caractériser ces écoles. (*c*) Qui en sont les chefs?

7. (1) Quels sont les caractères des divers groupes d'écrivains romantiques désignés par l'appellation (*a*) de violents, (*b*) de réalistes, (*c*) de lyriques, (*d*) de fantaisistes?

(2) Indiquer les principaux représentants de ces groupes et quelques unes de leurs œuvres.

8. Faire connaître les principes, les chefs et les productions (*a*) de l'école *parnassienne* et (*b*) de l'école *décadente*.

III ANNÉE.

HONNEURS.

Traiter quatre des sujets suivants:

1. Les Fabliaux: Origine. Esprit. Intention. Style.
2. Amyot: Son œuvre et sa langue.
3. L'Art poétique de Boileau.
4. La Fontaine et ses fables.
5. Le genre épistolaire et Mme de Sévigné.
6. Bossuet et Fénelon.
7. Etat de la littérature française en 830.
8. Balzac.

HONNEURS III ET IV ANNÉES.

PHILOLOGIE ROMANE.

VENDREDI, 20 AVRIL.—DE 9 HEURES A MIDI.

(*a* Traduisez en français moderne :

Chanson de Roland.

Franceis se drecent, si se metent sour piez :
Bien sont assols, quite de lor pechiez ;
E l'arcevesques de Dieu les at seigniez ;
Puis sont montét sour lor coranz destriers :
Adobét sont a lei de chevaliers
E de bataille sont tuit apareilliét.
Li cons Rodlanz apelet Olivier ;
" Sire compaing, molt bien lo disiiez :
Par Guenelon somes a mort jugiét ;
Pris en at or ed aveir e deniers.
Li emperedre nos devreit bien vengier.
Li reis Marsilies de nos at fait marchiét ;
Mais as espedes l'estovrat eslegier. "

(*b*) *Vie de Saint Alexis*

Mult lungamant ai od lui converset ;
De nule cose certes nel sai blasmer,
Co mei est vis que co est li hum deu.
Tut suls s'en est Eufemiens turnez,
Vint a sun fil ou gist suz lu degret.

(*c*) Saint Alexis out bone volentet,
Pur oec est oi en cest jurn onurez.
Li cors an gist an Rome la citet,
E l'anema en est enz el paradis deu.
Bien poet liez estra chi si est aluez.

Donner les *etyma* de tous les mots de 1 (*b*).

3. Commenter, discuter, en citant d'autres exemples semblables orn, *gua*rdet, k*ie*rs, f*ei*z et t*ei*, *o*r (adverbe), *o*r (substantif), pe*d*re,

parfait, me et mei, huit, main, aujourd'hui, civ(i)tatem, certes (1 b) anema (1 c), paradis (1 c), liez (1 c), deu (1 c), vint (1 b), converset (1 b), bone (1 c), gist (1 b), turnez et aluez (1 b & c), bien (1 c), Pur (1 c), medium, lit, co'lubra et pari'etem, rationem et platea, racenum et placere. plaire et faire, craindre et sembler et voudrai et tendre, loyal et royal.

4 Donner tous les dérivés des différents cas de *senior, imperator, comes, melior.*

5 De quelle nature sont les frontières *linguistiques* ?

6. Discuter l'action de l'analogie dans les verbes.

7. Discuter, l'unification des présents de l'indicatif qui modifiaient anciennement leur radical (Stammabstufung).

QUATRIÈME ANNÉE.

HONNEURS.

Traiter quatre des sujets suivants :

1. Les essais de Montaigne, en particulier ses idées pédagogiques.

2. Scarron et les grotesques français.

3. Vie, humeur, art, style et œuvre de Pascal.

4. Rivarol.

5. P. L. Courier.

6. Vert-Vert de Gresset.

7. Salammbô. (Flaubert) ou le Défilé des Dieux dans la Tentation de Saint-Antoine.

8. La Poésie Contemporaine.

GERMAN

SESSIONAL EXAMINATIONS.

FIRST YEAR.

GRAMMAR AND TRANSLATION OF PRESCRIBED TEXTS.

THURSDAY, APRIL 12TH :—MORNING, 9 TO 12.

1. Translate into English:—

(*a*) Ein peinlich langer Monat ist vorüber,
Seitdem die vierzig Kommissarien
In diesem Schloß mich überfallen, Schranken
Errichtet, schnell, mit unanständiger Eile,
Mich unbereitet, ohne Anwalts Hilfe,
Vor ein noch nie erhört Gericht gestellt,
Auf schlaugefaßte schwere Klagepunkte
Mich, die Betäubte, Überraschte, flugs
Aus dem Gedächtnis Rede stehen lassen —
Wie Geister kamen sie und schwanden wieder.
Seit diesem Tage schweigt mir jeder Mund,
Ich such' umsonst in Eurem Blick zu lesen,
Ob meine Unschuld, meiner Freunde Eifer,
Ob meiner Feinde böser Rat gesegt.
Brecht endlich Euer Schweigen — Laßt mich wissen,
Was ich zu fürchten, was zu hoffen habe.

(*b*) Die Richter! Wie, Mylady? Sind es etwa
Vom Pöbel aufgegriffene Verworfne,
Schamlose Zungendrescher, denen Recht
Und Wahrheit feil ist, die sich zum Organ
Der Unterdrückung willig dingen lassen?
Sind's nicht die ersten Männer dieses Landes,

Selbständig gnug, um wahrhaft sein zu dürfen,
Um über Fürstenfurcht und niedrige
Bestechung weit erhaben sich zu sehn?
Sind's nicht dieselben, die ein edles Volk
Frei und gerecht regieren, deren Namen
Man nur zu nennen braucht, um jeden Zweifel,
Um jeden Argwohn schleunig stumm zu machen?

(c) Du gabst dem Eifer ein gebührend Lob,
Der Burleighs treue Brust beseelt — Auch mir,
Strömt es mir gleich nicht so beredt vom Munde,
Schlägt in der Brust kein minder treues Herz.
Mögst du noch lange leben, Königin,
Die Freude deines Volks zu sein, das Glück
Des Friedens diesem Reiche zu verlängern!
So schöne Tage hat dies Eiland nie
Gesehn, seit eigne Fürsten es regieren.

(d) Hörst du das Hifthorn? Hörst du's klingen,
Mächtigen Rufes, durch Feld und Hain?
Ach, auf das mutige Roß mich zu schwingen,
An den fröhlichen Zug mich zu reihn!
Noch mehr! O die bekannte Stimme,
Schmerzlich süßer Erinnerung voll.
Oft vernahm sie mein Ohr mit Freuden
Auf des Hochlands bergichten Heiden,
Wenn die tobende Jagd erscholl.

(e) Aber die drohenden Schrecknisse einer länger dauernden Belagerung und das damals schon mit hoher Wahrscheinlichkeit vorauszusehende Ende waren doch nur wenigen erkennbar. Man gewann selbst diesen Zuständen einen die Eitelkeit und den Dünkel befriedigenden Reiz ab. Der erfinderische Versuch, durch Brieftauben und Luftballons einen Verkehr mit der Außenwelt zu bewerkstelligen, trug viel zu der erwartungsvollen Spannung der Gemüter bei, besonders aber unterhielt das unaufhörliche Bombardement von den

Forts auf die Linien der Belagerer und die sich wiederholenden Ausfälle, anfänglich zuerst in südlicher Richtung unternommen, eine ruhelose Aufregung. Man hielt es für unmöglich, daß Paris fallen könne; man hoffte auf einen Entsatz von der Loirearmee oder von einem Durchbruche Bazaines?

(*f*) „Früher war es gewesen, als wenn an der Stelle, wo der Junge saß, ein Kobold säße, und er hätte über die ganze Klasse weg gekräht — jetzt war es, als wenn an der Stelle ein Loch wäre — ganz still und blaß saß er an seinem Platz.....

„Aber das Alles," fuhr es fort, „hätte sich im Laufe der Zeit vielleicht noch ausgewachsen und wiedergegeben — aber die Menschen!"....

„Es giebt Menschen," sagte er grollend, „die sind wie das Giftkraut auf dem Felde, an dem sich die Tiere den Tod in den Leib fressen. An solchen Menschen vergiften sich die übrigen!"

(*g*) Die Stunden nahmen ihren gewöhnlichen Verlauf. Schon schlug die Glocke elf Uhr, schon hatte Herr Eckart den kleinen Schulz zugeklappt und Max atmete beruhigt auf; da näherte sich ihm der Doktor mit einer plötzlichen Wendung und sagte mit diabolischer Freundlichkeit:

„Engelmann, komme doch mit mir nach Hause, ich habe dir etwas zu sagen."

„Ja wohl, Herr Doktor," antwortete Max devot und gefaßt, er zwang sich sogar zu einem Lächeln, aber in seinem Innern krächzte der Rabe Schuldbewußtsein: „Du bist geliefert."

Fürchterliche Gedanken durchkreuzten das Gehirn des Schöpfers der Ziegenbartpoesie, als er, gefolgt von den mitleidigen und schadenfrohen Blicken seiner Kameraden auf der linken Seite des Doktors Eckart durch die Straßen schlich, und während dieser von ganz harmlosen Dingen sprach, waren die Gedanken des jungen Unglücklichen bei dem König Astyages, der den Knaben des Harpagus in sein Haus lockte.

2. Give the principal parts of all the strong verbs in 1 (*a*), (*c*) and (*d*).

3. Distinguish between *um'gehen* and *umgeh'en*, *ü'berlegen* and *üb erle'gen*, and state the underlying principle.

4. How would you avoid the ambiguity of the phrase: *sie lieben sich?*

5. State the chief rules which affect the order of words in sentences. What is the relative position of pronoun objects and noun objects?—of noun objects to one another?

6. Distinguish between the superlative form with *am* and that with *auf*. Give well-constructed sentences illustrating their use.

7. Show that the English Present Participle may be rendered into German by a great variety of subordinate adverbial constructions.

8. What is the broadest possible statement concerning the use of the subjunctive mood in German? Give certain subordinate rules which enable us to apply the general principle to special difficult cases.

9. Compose a few simple sentences illustrating the various uses, meanings and shades of meaning (*a*) of *doch*, (*b*) of *mag?*

FIRST YEAR SESSIONAL EXAMINATIONS.

GERMAN.

TRANSLATION (MAINLY AT SIGHT).

THURSDAY, APRIL 12TH :—AFTERNOON, 2 TO 5.

1. Translate (*at sight*) :—

(*a*) Die Federn einer Gans beſchämten den neugebornen Schnee. Stolz auf dieſes blendende Geſchenk der Natur, glaubte ſie eher zu einem Schwane, als zu dem, was ſie war, geboren zu ſein. Sie ſonderte ſich von ihres Gleichen ab und ſchwamm einſam und majeſtätiſch auf dem Teiche herum. Bald dehnte ſie ihren Hals, deſſen verräteriſcher Kürze ſie mit aller Macht abhelfen wollte; bald ſuchte ſie ihm die prächtige Biegung zu geben, in welcher der

Schwan das würdige Ansehen eines Vogels des Apollo hat. Doch vergebens, er war zu steif, und mit aller ihrer Bemühung brachte sie es nicht weiter, als daß sie eine lächerliche Gans ward, ohne ein Schwan zu werden.

Lessing.

(*b*) „Nein, sagen sollst Du, was Du gesungen hast!" schrie Peter beinahe außer sich und packte ihn noch fester an; die zwei andern aber, als sie dies sahen, zögerten nicht lange, sondern fielen mit derben Fäusten über den armen Peter her und walkten ihn derb, bis er vor Schmerzen das Gewand des dritten ließ und erschöpft in die Knie sank. „Jetzt hast Du Dein Teil," sprachen sie lachend, „und merk Dir, toller Bursche, daß Du Leute, wie wir sind, nimmer anfällst auf offenem Wege."....

Da ergrimmte der Riese und riß die Kammerthür auf. „Komm herein und lies die Zettel alle, und jenes dort, schau, das ist Peter Munks Herz; siehst Du, wie es zuckt? Kann man das auch aus Wachs machen?"

„Und doch ist es aus Wachs," antwortete Peter. „So schlägt ein rechtes Herz nicht; ich hab' das meinige noch in der Brust. Nein, zaubern kannst Du nicht!"

(*c*) Sollt' ich ihn töten? Konnt' ich's, da ich ihm
Ins Auge sah? Ihn töten! Eher hätt' ich
Den Mordstahl auf die eigne Brust gezückt!
Und bin ich strafbar, weil ich menschlich war?
Ist Mitleid Sünde? — Mitleid! Hörtest du
Des Mitleids Stimme und der Menschlichkeit
Auch bei den andern, die dein Schwert geopfert?
Warum verstummte sie, als der Walliser dich,
Der zarte Jüngling, um sein Leben flehte?
Argistig Herz! Du lügst dem ew'gen Licht,
Dich trieb des Mitleids fromme Stimme nicht!
Warum mußt' ich ihm in die Augen sehn!
Die Züge schaun des edeln Angesichts!

Mit deinem Blick fing dein Verbrechen an,
Unglückliche! Ein blindes Werkzeug fordert Gott,
Mit blinden Augen mußteſt du's vollbringen!

Schiller.

(*d*) Wer recht in Freuden wandern will,
Der geh' der Sonne' entgegen;
Da iſt der Wald ſo kirchenſtill,
Kein Lüftchen mag ſich regen;
Noch ſind nicht die Lerchen wach,
Nur im hohen Gras der Bach
Singt leiſe den Morgenſegen.

2. Translate into German :—

(*a*) Can you describe Dr. Eckart?

He was a High School teacher, about twenty-five years of age, tall, well built, had a clear complexion, and stooped a little.

Had he been a teacher long?

Not very long, but long enough to get very much annoyed at the scholars.

Why, what had the boys done to him?

Oh, they teased him a good deal and called him Billy-goat.

Well, he was very foolish to get angry at that. Why didn't his father talk to him about it?

He did when he knew of it. He told him what he had done when he was a young man, and what his master had said.

I suppose the father thrashed the fellow who had made fun of him?

(*b*) One evening, as they were talking together, he told him confidentially what a sly plan he had adopted to keep his money, and asked him whether he would advise him to bury a second sum in the same place. The neighbor, greedy to get a still larger sum, told him he could do nothing better with it.

(*c*) I never should have thought that you could learn German in so short time. I am convinced that you could not have done as well in Leipzig, where there are so many English and Americans. I only hope that you may continue to make as rapid progress as in the past. You may say now that you know German. I should like my daugh-

ter to take the same course, and if my son were not obliged to leave the town, I should recommend it to him.

(*d*) After we had reached the shore by means of a boat, we went to an inn in order to dry our clothes.

The more diligently I study the German language, the more clearly I see that it is very much like the English.

The apprentice has received permission to send his work to the exhibition.

The conversation of my companion concerned the vanity of human wishes and the immortality of the human soul.

The war is unhappily not yet over; but at last we can foresee the end of it.

(*e*) As a Christian you can not forget so clear a proof of the love and goodness of God.

It will be conducive to your health to take a walk every day.

Those on whose help we most relied were the first to forsake us.

While I was considering the matter, I received a letter which relieved me of all further doubt.

The physician gave us hope that the patient would recover.

England (you say) had received her hospitably!

INTERMEDIATE EXAMINATIONS.

GERMAN.

THURSDAY, APRIL 12TH:—MORNING, 9 TO 12.

1. Translate the following extracts and indicate briefly their places in the dramas from which they are taken: also explain references marked (*).

(*a*) Das iſt es, was mir nicht gefallen will!
Sie flieht der Schweſtern fröhliche Gemeinſchaft,
Die öden Berge ſucht ſie auf, verläſſet
Ihr nächtlich Lager vor dem Hahnenruf,
Und in der Schreckensſtunde, wo der Menſch
Sich gern vertraulich an den Menſchen ſchließt,
Schleicht ſie, gleich dem einſiedleriſchen Vogel,

Heraus ins graulich düstre Geisterreich
Der Nacht, tritt auf den Kreuzweg hin und pflegt
Geheime Zwiesprach mit der Luft des Berges.

(*b*) Das ist ein Scherz, ein heitres Spiel, ein Fest,
Das er* sich selbst und seinem Herzen giebt,
Sich eine schuldlos reine Welt zu gründen
In dieser rauh barbar'schen Wirklichkeit.
Doch was er Großes, Königliches will —
Er will die alten Zeiten wieder bringen,
Wo zarte Minne herrschte, wo die Liebe
Der Ritter große Heldenherzen hob,
Und edle Frauen zu Gerichte saßen,
Mit zartem Sinne alles Feine schlichtend.

(*c*) Sei immer menschlich, Herr, im Glück, wie du's
Im Unglück warst — und auf der Größe Gipfel
Vergiß nicht, was ein Freund wiegt in der Not;
Du hast's in der Erniedrigung erfahren.
Verweigre nicht Gerechtigkeit und Gnade
Dem Letzten deines Volks; denn von der Herde
Berief dir Gott die Retterin —
Der Hochmut nur kann sie zum Falle führen,
Und von den niedern Hütten, wo dir jetzt
Der Retter ausging, droht geheimnisvoll
Den schuldbefleckten Enkeln das Verderben*!

(*d*) Erhabene Vernunft, lichthelle Tochter
Des göttlichen Hauptes, weise Gründerin
Des Weltgebäudes, Führerin der Sterne,
Wer bist du denn, wenn du, dem tollen Roß
Des Aberwitzes an den Schweif gebunden,
Ohnmächtig rufend mit dem Trunkenen
Dich sehend in den Abgrund stürzen mußt!
Verflucht sei, wer sein Leben an das Große
Und Würd'ge wendet und bedachte Plane
Mit weisem Geist entwirft! Dem Narrenkönig
Gehört die Welt —

(*e*) Erst zeimte es sich nicht; nun wollen Sie nicht? Ja, das ist was anderes. (Etwas ärgerlich.) Sie wollen mein Schuldner nicht sein? Wenn Sie es denn aber schon wären? Oder sind Sie dem Manne nichts schuldig, der einmal den Hieb auffing, de Ihnen den Kopf spalten sollte, und ein andermal den Arm vom Rumpfe hieb, der eben losdrücken und Ihnen die Kugel durch die Brust jagen wollte? Was können Sie diesem Manne mehr schuldig werden? Oder hat es mit meinem Halse weniger zu sagen als mit meinem Beutel? — Wenn das vornehm gedacht ist, bei meiner armen Seele, so ist es auch sehr abgeschmackt gedacht!

(*f*) Franziska. Sie können unmöglich satt sein, gnädiges Fräulein.

Das Fräulein. Meinst du, Franziska? Vielleicht, daß ich mich nicht hungrig niedersetzte.

Franziska. Wir hatten ausgemacht, seiner währender Mahlzeit nicht zu erwähnen. Aber wir hätten uns auch vornehmen sollen, an ihn nicht zu denken.

Das Fräulein. Wirklich, ich habe an nichts als an ihn gedacht.

Franziska. Das merkt' ich wohl. Ich fing von hundert Dingen an zu sprechen, und Sie antworteten mir auf jedes verkehrt. Hier kömmt eine Nahrung, bei der man eher Grillen machen kann. Der liebe, melancholische Kaffee!

Das Fräulein. Grillen? Ich mache keine. Ich denke bloß der Lektion* nach, die ich ihm geben will. Hast du mich recht begriffen, Franziska?

Franziska. O ja; am besten aber wär' es, er ersparte sie uns.

Das Fräulein. Du wirst sehen, daß ich ihn von Grund aus kenne. Der Mann, der mich jetzt mit allen Reichtümern verweigert, wird mich der ganzen Welt streitig machen, sobald er hört, daß ich unglücklich und verlassen bin.

2. State at some length the points in which Schiller departs from historic facts in his „Jungfrau" and comment upon the merits of the drama. When was the play written?

3. Discuss the character of Tellheim. What is the importance of Lessing's „Minna von Barnhelm" in German literature?

4. Comment on the forms :—dir (c. l. 7), erhaben, Aberwitz, kömmt; and give the principal parts of hob, hieb, wiegt.

5. Give the meaning of and construction required by the following adjectives, forming short sentences to illustrate the same :—bedürftig, überlegen, eingedenk neidisch, gewachsen, voll, bange.

6. Translate :—Die Athener verurteilten Sokrates zum Tode, weil er die Jugend verdarb. Would the sense be different if the last word were verderbe? Explain clearly.

7. Would you say :—Ich mache ein Loch in die Wand or in der Wand? Why? Distinguish between :—Er setzte sich ans Ufe- and Er setzte sich am Ufer.

INTERMEDIATE EXAMINATIONS.

GERMAN.

THURSDAY, APRIL 12TH :—AFTERNOON, 2 TO 5.

1. Translate (*at sight*) :—

(*a*) Im Schatten eines mächtigen Felsen saß Wilhelm an einer Stelle, wo sich der steile Gebirsweg um eine Ecke herum schnell nach der Tiefe wendete. Die Sonne stand noch hoch und erleuchtete die Gipfel der Fichten in den Felsengründen zu seinem Füßen. Er bemerkte eben etwas in seine Schreibtafel, als Felix, der umhergeklettert war, mit einem Stein in der Hand zu ihm kam. „Wie nennt man diesen Stein?" sagte der Knabe.

„Ich weiß nicht," versetzte Wilhelm.

„Ist das wohl Gold, was darin so glänzt?" sagte jener.

„Es ist keins!" versetzte dieser: „und ich erinnere mich, daß es die Leute Katzengold nennen."

„Katzengold!" sagte der Knabe lächelnd: „und warum?"

„Das will ich mir merken," sagte der Sohn und steckte den Stein in die lederne Reisetasche.

Kaum war dieses gesprochen, so zeigte sich den schroffen Weg herab eine sonderbare Erscheinung. Zwei Knaben, schön wie der Tag, in farbigen Jäckchen, sprangen einer nach dem andern herunter, und Wilhelm fand Gelegenheit sie näher zu betrachten, als sie vor ihm stutzten und einen Augenblick still hielten. Um des ältesten Haupt bewegten sich reiche blonde Locken, auf welche man zuerst blicken mußte, wenn man ihn sah, und dann zogen seine klar-blauen Augen den Blick an sich, der sich mit Gefallen über seine schöne Gestalt verlor. Der zweite, mehr einen Freund als einen Bruder vorstellend, war mit braunen Haaren geziert, die ihm über die Schultern herabhingen, und wovon der Widerschein sich in seinen Augen zu spiegeln schien.

Wilhelm hatte nicht Zeit, diese beiden sonderbaren und in der Wildnis ganz unerwarteten Wesen näher zu betrachten, indem er eine männliche Stimme vernahm, welche um die Felsecke herum ernst, aber freundlich herabrief: „Warum steht ihr stille? versperrt uns den Weg nicht."

Wilhelm sah aufwärts, und hatten ihn die Kinder in Verwunderung gesetzt, so erfüllte ihn das, was ihm jetzt zu Augen kam, mit Erstaunen. Ein tüchtiger, nicht allzugroßer junger Mann, von brauner Haut und schwarzen Haaren, trat kräftig und sorgfältig den Felsweg herab, indem er hinter sich einen Esel führte, der erst sein wohlgenährtes und wohlgeputztes Haupt zeigte, dann aber die schöne Last, die er trug, sehen ließ. Ein sanftes, liebenswürdiges Weib saß auf einem großen, wohlbeschlagenen Sattel; in einem blauen Mantel, der sie umgab, hielt sie ein Kind, das sie an ihre Brust drückte und mit unbeschreiblicher Lieblichkeit betrachtete. Dem Führer ging's, wie den Kindern: er stutzte einen Augenblick, als er Wilhelm erblickte. Das Tier verzögerte seinen Schritt, aber der Abstieg war zu jäh, die Vorüberziehenden konnten nicht anhalten, und Wilhelm sah sie mit Verwunderung hinter der vorstehenden Felswand verschwinden.—(Goethe.)

(*b*) Das Mädchen von Orleans.

Das edle Bild der Menschheit zu verhöhnen
Im tiefsten Staube wälzte sich der Spott;
Krieg führt der Witz auf ewig mit dem Schönen,
Er glaubt nicht an den Engel und an Gott;
Dem Herzen will er seine Schätze rauben,
Den Wahn bekriegt er und verletzt den Glauben.

Doch wie du selbst, aus kindlichem Geschlechte,
Selbst eine fromme Schäferin, wie du,
Reicht dir die Dichtkunst ihre Götterrechte,
Schwingt sich mit dir den ewigen Sternen zu,
Mit einer Glorie hat sie dich umgeben;
Doch schuf das Herz, du wirst unsterblich leben.

Es liebt die Welt, das Strahlende zu schwärzen
Und das Erhabne in den Staub zu ziehn,
Doch fürchte nicht! Es giebt noch schöne Herzen,
Die für das Hohe, Herrliche erglühn.
Den lauten Markt mag Momus unterhalten;
Ein edler Sinn liebt edlere Gestalten.—(Schiller.)

2. Translate into German:—

a) When Lessing was secretary of General Tauenzien, he had a fine opportunity (die Gelegenheit) to study military life While he was at Breslau he became acquainted with many officers, and after the peace in 1763 he often saw discharged (entlassen) officers in nearly the same situation as his Tellheim. All the characters of his comedy, except Riccaut, are Germans, and belong to the time of the Seven Years' War, at the close (das Ende) of which the plot (die Handlung) is laid. Lessing also learned of the generous (edelmütig) deed of Major Marschall von Bieberstein, who had saved the small town of Lübben from burning by advancing (vorschießen) the money demanded of it. The poet makes use of this incident (das Ereignis) in his play. The unjustifiable (unberechtigt) dismissal of good and brave officers was no uncommon occurrence at the close of the Seven Years' War. Many volunteer battalions (das Freibataillon) were discharged, and men and officers were sent home without reward for their faithful services.

(*b*) There was once upon a time a poor woman who had two children. The youngest had to go every day into the forest and fetch wood. One day a beautiful boy met her, helped her to gather (lesen) wood and carried the load (die Last) home; then he vanished One day the child brought a rosebud (die Rosenknospe) home with her and told her mother that the boy had given her the rose and had promised her that when the bud was open (aufgeblüht) he would come again. The mother put the flower in water. One morning the mother found the child dead in her little bed; in the night the rose had opened.

THIRD AND FOURTH YEARS—HONOURS IN GERMAN.

HISTORY OF GERMAN LITERATURE.

SATURDAY, APRIL 7TH:—MORNING, 9 TO 12.

1. Eine ausführliche Besprechung der folgenden fünf Fragen wird verlangt:

(*a*) Die Sprachgesellschaften des 17ten Jahrhunderts.
(*b*) Gottsched's Reform des deutschen Theaters.
(*c*) Lessings Verhältnis zum französischen klassischen Theater.
(*d*) Die Goethe—Schiller'sche Freundschaft.
(*e*) Schiller als Historiker.

2. Geben Sie den Inhalt der *Iphigenie* an.

3. Was ist eine Robinsonade?

4. Nennen Sie deutsche Romane des 17ten Jahrhunderts.

5. Nennen Sie die bedeutendsten kritischen Werke über die deutsche Dichtkunst.

6. Geben Sie eine kurze Lebensbeschreibung Klopstocks.

HONOURS IN GERMAN—THIRD AND FOURTH YEARS.

MONDAY, APRIL 9TH:—THREE HOURS.

1. Translate into English:—

Die Braut von Messina, Ein Zimmer im Innern des Palastes,
Nun endlich .... lächelnd ein.

2. Charakterisiren Sie das Antike in der Fabel der Braut von Messina.

3. Erläutern Sie die Rolle des Chors (*a*) in der griechischen Tragödie, (*b*) in der Braut von Messina.

4. *Emilia Galotti.* Schildern Sie den Charakter des Prinzen.

5. (*a*) Wie steht es mit den Einheiten in *Emilia Galotti*?

(*b*) Nennen Sie Lessing's gleichzeitiges kritisches Werk.

(*c*) Wie versucht Lessing das unverdiente tragische Ende der Emilia zu motiviren?

6. Geben sie den Inhalt der Grillparzer'schen Sappho an.

7. Erläutern Sie Herder's Anschauungen über das Wesen der Poesie, besonders der Volkspoesie, und sein Verhältnis zu dem jungen Goethe.

HONOURS IN GERMAN—THIRD AND FOURTH YEARS.

FAUST.

WEDNESDAY, APRIL 11TH:—MORNING, 9 TO 12.

N.B.—Questions expressed in German are to be answered in German.

1. Translate into English the first two stanzas of the *Zueignung*:

2. Geben Sie den Inhalt des Marlowe'schen Bühnenspiels *oder* eines von den Faustbüchern.

3. Besprechen Sie Lessing's Beitrag zu der Faustlitteratur.
oder
Was ist Faustisch in Goethe's Straszburger Periode?

4. Erläutern Sie die folgenden 1788 im italienischen Tagebuch geschriebenen Worte: "Das Manuscript ist noch das erste, ja in den Hauptscenen gleich so ohne Concept hingeschrieben."

5. Was ist das Thema des *Prologs im Himmel*?

6. Citeren Sie einige den Erdgeist betreffende, nicht miteinander in Einklang zu bringende Stellen. Wie löst Kuno Fischer diesen Konflikt?

7. Geben Sie die Bezeichnungen der Hauptscenen, der Reihe nach.

8. Erläutern Sie die folgenden Stellen:

(*a*) Du, Geist der Erde, bist mir näher, (*b*) Zwar euer Bart ist kraus, doch hebt ihr nicht die Riegel, (*c*) Erwarte nicht das dreimal

glühende Licht, (*d*) Dies sind die kleinen von den Meinen, (*e*) Mir widersteht das tolle Zauberwesen, (*f*) wie ihr aus Dunst und Nebel um mich steigt, (*g*) Vom Himmel durch die Welt zur Hölle, (*h*) Und beide dann mit offnem Flammenfeuer aus einem Brautgemach ins andere gequält.

9. Charakterisiren Sie die Sphären der drei Erzengel.

10. Citiren Sie so viele Zeilen wie möglich aus dem Gespräch zwischen Mephistopheles und dem Schüler.

B.A. ORDINARY AND THIRD YEAR GERMAN.

TUESDAY, APRIL 17TH:—AFTERNOON, 2 TO 5.

1. Translate the following passages and explain (in English) where and in what connection they occur:—

(*a*) Ich sehe dich, im wilden Eisgebirg'
Verirrt, von einer Klippe zu der andern
Den Fehlsprung thun, seh', wie die Gemse dich
Rücksprungend mit sich in den Abgrund reißt,
Wie eine Windlawine dich verschüttet,
Wie unter dir der trügerische Firn
Einbricht, und du hinabsinkst, ein lebendig
Begrabner, in die schauerliche Gruft —
Ach, den verwegnen Alpenjäger hascht
Der Tod in hundert wechselnden Gestalten!
Das ist ein unglückseliges Gewerb',
Das halsgefährlich führt am Abgrund hin.

(*b*) Euch zu verteid'gen, eure hohe Unschuld
Zu schützen vor der Rache des Tyrannen,
Will er zum Morde jetzt den Bogen spannen.
Ich laure auf ein edles Wild — Läßt sich's
Der Jäger nicht verdrießen, Tage lang
Umher zu streifen in des Winters Strenge,
Von Fels zu Fels den Wagesprung zu thun,
Hinan zu klimmen an den glatten Wänden,
Wo er sich anleimt mit dem eignen Blut,
— Um ein armselig Grattier zu erjagen.
Hier gilt es einen köstlicheren Preis,
Das Herz des Todfeinds, der mich will verderben.

(*c*) Ich bin so krank, so schwach. Alle meine Gebeine sind hohl. Ein elendes Fieber hat das Mark ausgefressen. Keine Ruh und Rast, weder Tag noch Nacht. Im halben Schlummer giftige Träume. Die vorige Nacht begegnete ich Götzen im Wald. Er zog sein Schwert und forderte mich heraus. Ich faszte nach meinem, die Hand versagte mir. Da stiesz er's in die Scheide, sah mich verächtlich an und ging hinter mich. — — Er ist gefangen und ich zittre vor ihm. Elender Mensch! Dein Wort hat ihn zum Tode verurtheilt, und du bebst vor seiner Traumgestalt wie ein Missethäter! — Und soll er sterben? — Götz! Götz! —Wir Menschen führen uns nicht selbst, bösen Geistern ist Macht über uns gelassen, dasz sie ihren höllischen Mutwillen an unserm Verderben üben. (setzt sich.)

Matt! Matt! Wie sind meine Nägel so blau! — Ein kalter, kalter, verzehrender Schweisz lähmt mir jedes Glied. Es dreht mir alles vorm Gesicht. Könnt' ich schlafen.

(*d*) Sie schrieb darin ganz kurz: „Es ist alles wieder gut, alle Hindernisse sind beseitigt. Ich benutzte heimlich diese Gelegenheit, um die erste zu sein, die Ihnen diese freudige Botschaft schreibt. Kommen, eilen Sie zurück. Es ist so öde hier und ich kann kaum mehr leben, seit Sie von uns fort sind. Aurelie.

2. Translate (*at sight*) :—

Unter den Ereigniſſen des dreizehnten Jahrhunderts wird die größte That des deutſchen Volkes noch zu wenig gewürdigt: die wunderbar ſchnelle Germaniſierung der Slavenländer im Oſten der Elbe. Eine Auswanderung deutſcher Herren und Arbeiter hat in etwa hundert Jahren ein weites Ländergebiet mit vielen Hunderten deutſcher Städte und Tauſenden deutſcher Dörfer beſetzt und zum großen Teil feſt an Deutſchland gekettet. Faſt der ganze öſtliche Teil des preußiſchen Staates liegt auf dem Boden der Koloniſation des dreizehnten Jahrhunderts.

Wir vermögen nicht mehr nachzuweiſen, wie damals in der Seele des deutſchen Volkes die Auswanderungsluſt zu einer mächtigen Leidenſchaft erwachſen iſt. Allerdings hatten die Römerzüge der Hohenſtaufen und noch mehr die Kreuzfahrten die Maſſe in ihren Tiefen aufgewühlt und unruhig, wanderluſtig, nach Fremdem begierig gemacht; allerdings war damals das Leben im innern Deutſchland für den friedlichen Arbeiter gefahrvoll, oft unerträglich geworden. Und noch vermögen wir zuweilen die Geſtalt des frommen Mönches zu erkennen, einen unternehmenden Edelmann oder eine junge Fürſtenbraut, welche an die Bauernhütten ihrer Heimat pochten und die jungen Feldarbeiter mit gutem Verſprechen unter das polniſche Volk riefen. Aber doch iſt uns vieles von der großen Auswanderung unverſtändlich geworden.

3. Translate freely into German (*at sight*) :—

I was always fond of visiting new scenes, and observing strange characters and manners. Even when a mere child I began my travels, and made many tours of discovery into foreign parts and unknown regions of my native city, to the frequent alarm of my parents. As I grew into boyhood, I extended the range of my observations. My holiday afternoons were spent in rambles about the surrounding country. I made myself familiar with all its places famous in history or fable. I visited the neighbouring villages, and added greatly to my stock of knowledge by noting their habits and customs, and conversing with their sages and great men. I even journeyed one long summer's day to the summit of the most distant hill, whence I stretched my eye over many a mile of country, and was astonished to find how vast a globe I inhabited.

4. Explain the terms der Landfrieden, Ihro, Urfehde ſchwören, ein fünfzig Mann,

or

Give a sketch of the Nibelungenlied.

5. Write extract (*d*) in *oratio obliqua*.

6. Write not less than 250 words (in German) on one of the following subjects :—

(*a*) Tell's motives for shooting Gessler.
(*b*) Is the fifth Act of Tell necessary ?
(*c*) Sickingen's part in Goetz.
(*d*) Anything connected with the last named play.
(*e*) Johann Gottfried von Herder.
(*f*) Gottfried August Bürger.

B.A. HONOURS IN GERMAN.

WEDNESDAY, APRIL 18TH :—AFTERNOON, 2 TO 5.

1. (*a*) Der Inhalt des Goethe'schen Egmont. (*b*) Schiller's Rezension desselben.

2. Üb Sie ins Englische : *Laokoon* (marked passage).

3. In welchem Werk bespricht Herder den Laokoon Lessings ?

Vergleichen Sie die kritischen Methoden und die ästhetischen Ansichten der beiden Dichter.

4. Eine Lebensbeschreibung Freytags.

5. (*a*) Der Inhalt der Sudermann'schen *Ehre*. (*b*) Andere Werke desselben Verfassers.

6. Heine's Verhältnis zu der ältesten Tochter seines Onkels, und die daraus entsprungene Lyrik. Die ersten Zeilen seiner populärsten Lieder.

HEBREW.

INTERMEDIATE EXAMINATIONS.

MONDAY, APRIL 2ND:—MORNING, 9 TO 12.

1. Translate literally into English:—

וַיֹּאמֶר יְהוָה אֱלֹהִים הֵן הָאָדָם הָיָה כְּאַחַד מִמֶּנּוּ
לָדַעַת טוֹב וָרָע וְעַתָּה פֶּן־יִשְׁלַח יָדוֹ וְלָקַח גַּם מֵעֵץ
הַחַיִּים וְאָכַל וָחַי לְעֹלָם: וַיְשַׁלְּחֵהוּ יְהוָה אֱלֹהִים
מִגַּן־עֵדֶן לַעֲבֹד אֶת־הָאֲדָמָה אֲשֶׁר לֻקַּח מִשָּׁם:

(*a*) Meaning of קין and הבל.

(*b*) Name and state the use of the main accents in the first sentence.

(*c*) Parse the verbs in the same.

(*d*) Account for the plural in אלהים.

(*e*) What are the peculiarities of לָקַח?

(*f*) Explain the ֶ in מִיָּדֵךְ.

(*g*) Inflect the Kal imperfect of עבר.

(*h*) Describe תֵּת.

2. Translate into English:—

וַיִּגַּע כָּל־בָּשָׂר רֹמֵשׂ עַל־הָאָרֶץ בָּעוֹף וּבַבְּהֵמָה
וּבַחַיָּה וּבְכָל־הַשֶּׁרֶץ הַשֹּׁרֵץ עַל־הָאָרֶץ וְכֹל הָאָדָם:

כֹּל אֲשֶׁר נִשְׁמַת־רוּחַ חַיִּים בְּאַפָּיו מִכֹּל אֲשֶׁר בֶּחָרָבָה
מֵתוּ: וַיִּמַּח אֶת־כָּל־הַיְקוּם ׀ אֲשֶׁר ׀ עַל־פְּנֵי הָאֲדָמָה
מֵאָדָם עַד־בְּהֵמָה עַד־רֶמֶשׂ וְעַד־עוֹף הַשָּׁמַיִם וַיִּמָּחוּ
מִן־הָאָרֶץ וַיִּשָּׁאֶר אַךְ־נֹחַ וַאֲשֶׁר אִתּוֹ בַּתֵּבָה: וַיִּגְבְּרוּ
הַמַּיִם עַל־הָאָרֶץ חֲמִשִּׁים וּמְאַת יוֹם:

(*a*) Inflect fully בָּשָׂר in the singular.

(*b*) What is the force of the article in הָרֹמֶשׂ?

(*c*) Parse (1) מֵתוּ (2) וַיִּמַּח (3) וַיִּמָּחוּ.

(*d*) Number of the nouns with the numerals.

(*e*) Inflect סֵפֶר in the plural.

3. Transliterate into Hebrew :—Wăy-yăr' 'ĕlō-hîm 'ĕth + Kŏl + ' shĕr ᶜa-sā, wᵉhĭn-nē + tōbh mᵉ'ōdh ; * Wă-yᵉhî + ᶜé-rĕbh wă-yᵉhi + bhō-qĕr yôm hăsh-shĭsh-shî.

4. Point and translate :—

והאדם ידע את־חוה אשתו ותהר ותלד את־קין
ותאמר קניתי איש את־יהוה: ותסף ללדת את־אחיו
את־הבל ויהי־הבל רעה צאז וקין היה עבד אדמה:

5. Translate into Hebrew :—(1) God created them. (2) This great place. (3) God will sanctify the seventh day. (4) This is the day in which God rested. (5) Who formed every fowl of the heaven ?

6. Translate with notes :—לָקַח הָאִישׁ מִן־הֶעָפָר.

7. Synopsis of all the Imperfects of גָּרָה.

8. What is the מַסֹּרָה ?

9. Reading.

B. A. ORDINARY.

HEBREW.

MONDAY, APRIL 2ND:—MORNING, 9 TO 12.

1. Translate into English Isaiah I, 4 to 7 inclusive.

(*a*) State the kind of parallelism found in that section.

(*b*) Name the main accents and point out their use in verse 4.

(*c*) Write the plural of all the singular nouns, and the singular of all the plural *words* in verse 4.

(*d*) Parse, with special reference to the nature of the vowels:

(1) נָאֲצוּ (2) נָזֹרוּ (3) תֻּכּוּ (4) תּוֹסִיפוּ (5) לֶחְלִי.

(*e*) Inflect רֹאשׁ (singular and plural).

(*f*) Inflect the Kal imperfect of אָכַל.

(*g*) Translate into Hebrew:—Ye have heard the word of the Lord, but your heart has been hardened.

2. Translate Isaiah LIII, 8 to 10.

(*a*) Explain the Masoretic note in verse 8.

(*b*) What is the subject of וַיִּתֵּן?

(*c*) Parse the nouns in verse 9.

(*d*) Account for the pointing וַיהוָה.

(*e*) Inflect the Kal imperfect of רָאָה.

(*f*) Give the Greek word for צַדִּיק, and its precise meaning.

(*g*) Translate into Hebrew:—They have all gone astray like sheep.—Ye have sought the Lord, while he may be found.

3. Translate Psalm LXVIII, 1, 2, 14.

(*a*) Make a note on verse 14.

(*b*) Parse the verbs in the verse 2.

(*c*) Comment on this Psalm.

4. State briefly the work of the Massoreths.

5. What is the general contents of the following treatises of the Talmud: טבול יום—פרקי אבות—הדושים—יומא—ברכות?

NATURAL SCIENCE.

INTERMEDIATE EXAMINATION.

CHEMISTRY.

MONDAY, APRIL 2ND:—AFTERNOON, 2 TO 5.

NOTE.—Equations must be given wherever possible.

1. Give a brief account of the chemistry of chlorine. What substances are produced when it acts upon the alkalies, and what are the uses of the various products?

2. Describe the manufacture of sulphuric acid. Why is the formula H_2SO_4 given to it? Give some instances of its commercial application.

3. What are the sources of the element phosphorus? How is it isolated? Compare its acids and their salts with those of nitrogen.

4. Describe the different forms of carbon, and give a short account of the various compounds of carbon you have made use of.

5. What reactions take place when

(*a*) potash is added to solutions of sulphuric acid, ammonium sulphate, zinc sulphate, ferric chloride;

(*b*) hydrochloric acid is added to sodium carbonate, copper sulphide, ferrous sulphide, and lead nitrate?

6. Ozone is an allotropic form of oxygen, its molecule being represented by the formula O_3. Give the experimental evidence upon which this statement is based.

7. Enunciate and explain the Periodic Law.

8. Describe one of the commercial methods for the manufacture of sodium carbonate.

9. Give the general properties of the elements of the calcium group (calcium, strontium and barium); and describe the preparation and uses of quick-lime.

10. Tell what you know with respect to the metallurgy and properties of silver *or* copper.

THIRD YEAR.

PRACTICAL CHEMISTRY COURSE.

INDUSTRIAL CHEMISTRY.

TUESDAY, 27TH MARCH:—AFTERNOON, 2 TO 5.

1. Describe the operations of evaporation and distillation as carried on in industrial chemical works, giving sketches of the apparatus employed.

2. Mention the more important kinds of fuels, and describe the production of "producer gas."

3. Give a brief outline of the manufacture of sulphuric acid; and describe in detail the structure and use of one of the principal pieces of apparatus employed.

4. What are the two principal processes employed for the manufacture of soda; and what are the advantages of each?

5. Describe one of the processes for the recovery of the manganese in the chlorine industry.

6. What is the chief source of the ammonia of commerce, and how is it obtained from this source?

7. Enumerate the sources of commercial potash, and describe the preparation of potassium carbonate from one of them.

8. What is the chemical composition of glass? Describe the preparation of ordinary glass for tumblers, bottles, etc., and tell how these objects are produced from the molten glass.

THIRD AND FOURTH YEAR ARTS AND APPLIED SCIENCE.

ORGANIC CHEMISTRY.

SATURDAY, APRIL 7TH:—MORNING, 9 TO 12.

1. Explain fully what is meant by empirical, constitutional and graphic formulæ. Give examples. The percentage composition of a monobasic fatty acid is $C = 39.95$, $H = 6.69$, $O = 53.36$. and $0.296g$ of the silver salt gave on ignition $0.162g$ of silver. What is the molecular formula of the acid?

2. Describe a method for the quantitative estimation of chlorine in an organic substance.

3. How may pure ethane be prepared? Discuss briefly the general properties of the paraffins.

4. What are the alkylhalides? Describe the preparation of any member of this group and indicate by examples their use in organic synthesis.

5. Write a short account of the commercial preparation of methyl alcohol and tell how its constitutional structure has been established.

6. State how you would prepare the following substances from ethyl alcohol: (*a*) Iodoform, (*b*) Acetaldehyde, (*c*) Normal propyl alcohol, (*d*) Isopropyl alcohol.

7. Define clearly the terms saponification, hydrolysis, condensation polymerisation. Illustrate your answers by examples.

8. What are sulphonic acids? How are the fatty sulphonic acids obtained? What changes do these undergo on treatment with (*a*) Nascent hydrogen (*b*) Caustic potash?

THIRD YEAR.

BOTANY.

THREE HOURS.

1. Give as full an account as you can of the various forms of plastids as to

(*a*) their distinctive features,

(*b*) occurrence,

(*c*) principal reactions whereby they may be differentiated from other cell bodies.

2. Give a full account of Inulin as to its

(*a*) occurrence,

(*b*) chemical nature and relation to other plant products,

(*c*) distinctive reactions.

3. Collenchyma. Give a full account of its

(*a*) occurrence in plants,

(*b*) structural peculiarities,

(*c*) behavior towards

(1) chlor-iod-of-zinc,

(2) potassium hydrate.

(*d*) functional importance.

4. Show how (1) pure cellulose, (2) lignified tissues, and (3) suberised or cutinised tissues differ

(*a*) chemically,

(*b*) in their physical properties,

(*c*) relative durability,

and discuss the purpose of these modifications in relation to the plant economy.

5. Give a concise account of the Gymnospermous type of stem with respect to

(*a*) general structure and mode of increase,

(*b*) special nature of the xylem elements and their distribution,

(*c*) occurrence and distribution of resin.

(*d*) Carefully point out the essential respects in which the Dicotyledonous type of stem (arborescent) differs from the Gymnospermous type.

6. Give a concise account of the composition, occurrence and essential characteristics of the vascular bundle of the closed collateral type.

7. Present as carefully and fully as you can, a discussion of the relative phylogeny of the Gymnosperms and Angiosperms (Monocots. and Dicots.. based upon structural data.

8. Explain the method of determining the amplification of a microscope by direct measurement: also theoretically when the focal values of the objective and eye-piece are known, as obj. 1-6 in., e. p. 1 in., tube length 10 inches.

B.A. ORDINARY.

BOTANY.

THREE HOURS.

1. Discuss the properties of cytoplasm as illustrated by the plasmodium of Badhamia.

2. Give an outline of the classification of the Schizophyceæ, and note the distinguishing characteristics of each group.

3. Describe the structure and reproductive processes of Volvox. Trace the transitions from isogamy to oogamy in the Volvocineæ.

4. Write a description of a typical member of the Confervoideæ and discuss the relationships of the group.

5. Give an account of sexual reproduction and its variations in the Rhodophyceæ.

6. Describe the structure and the reproductive process of a typical member of the Ascomycetes.

Discuss the origin of the ascus.

7. Give a full account of the life-history of Anthoceros, and compare it with other members of the Hepaticæ.

8. Discuss the occurrence of heterospory in its bearing upon development. Describe a heterosporous member of the Lycopodineæ.

9. Give an outline of the steps in the evolution of the higher green plants, showing which forms are probably in the main line of descent.

The candidate will answer eight questions only, including number nine.

THIRD YEAR.

ZOOLOGY.

THURSDAY, APRIL 12TH:—MORNING, 9 TO 12.

1. Give an account of the process known as "conjugation" in the case of Paramoecium, and compare it with the process of fertilization as seen in Hydra.

2. Define the term "nervous system," explaining what are its fundamental constituents. Describe and compare the nervous systems of (*a*) an Anthomedusan, (*b*) Aurelia, (*c*) Lumbricus, (*d*) the Crayfish.

3. What is meant by the term "gnathite?" Describe the gnathites of the Cockroach, and compare them with those of the Crayfish.

4. Describe carefully the structure and mode of action of the water-vascular system of Asteroidea. What modifications have taken place in this system in the Ophiuroidea?

5. Describe the skull and vertebral column of the Dogfish, comparing them with corresponding structures in the Frog.

6. Describe the typical Reptilian skull as exemplified by Hatteria, and show the leading modifications which it has undergone in the living orders of Reptiles.

7. Describe and compare the heart and arterial system of the Frog and those of the Rabbit.

THIRD YEAR.

ZOOLOGY.

PRACTICAL EXAMINATION.

THURSDAY, APRIL 12TH :—AFTERNOON, 2 TO 5.

1. Dissect the Dogfish provided so as to display as completely as possible the kidney and the generative organs.

Mark with flag-labels,

(*a*) the mesonephros,

(*b*) the ducts leading from the metanephros to the ureter,

(*c*) the sperm sac.

2. Make a permanent preparation of specimen A and identify it; sketch your preparation, naming the parts.

3. Identify the specimen B, and make a sketch showing the principal parts.

4. Sketch and identify the specimen C.

B.A. ORDINARY.

ZOOLOGY.

WEDNESDAY, APRIL 18TH :—MORNING, 9 TO 12.

1. Give a short account of the anatomy and physiology of a simple sponge.

What are the principal factors in the modification which the higher sponges have undergone as compared with the simple type you have described?

2. Describe the anatomy of a Turbellarian.

Indicate the factors which have led to the complication of the genital organs within the group Turbellaria. How far can different stages in this evolution be found represented amongst the different living orders of Turbellaria?

3. Describe carefully the principal types of Crustacean larvae, indicating in each case the groups in which they appear, and how far the evidence justifies us in regarding them as possessing ancestral characters.

4. Describe the anatomy of the cœlom and its derivatives (kidneys and genital organs) in Nautilus and Sepia. Compare the structures you describe with the arrangements existing in other Mollusca, and show how far they are to be regarded as primitive.

5. Describe the anatomy of a Sea-cucumber (Holothurid) and compare it with that of the common Sea-urchin, showing the probable relation between the two.

6. Give an outline classification of the group Pisces, giving the diagnostic characters of each division you mention.

To which divisions are the oldest Amphibia related?

Give reasons for your answer.

7. Give an acccount of the various types of limb-bones met with amongst the Ungulata, and give any evidence from fossils with which you may be acquainted bearing on the evolution of the feet in this order.

8. What is meant by the term "gastrulation"?

Give an account of the gastrulation of the Vertebrata, tracing it from Amphioxus up to the chick.

B.A. ORDINARY.

ZOOLOGY.

PRACTICAL EXAMINATION.

WEDNESDAY, APRIL 18TH:—AFTERNOON, 2 TO 5.

1. Dissect the specimen A so as to expose as much as possible of the blood system. Mark the most important parts with flag-labels.

2. Dissect the specimen B so as to display as much as possible of the Anatomy. Indicate by means of flag labels the nerve-ganglion, the ovary and the opening of the vas deferens.

3. Mount microscopically the specimens found in the watch-glass C. Identify and sketch your preparations.

4. Refer to its proper Order the skeleton D, giving reasons for your answer.

B.A. ORDINARY AND THIRD YEAR APPLIED SCIENCE.

GEOLOGY.

WEDNESDAY, APRIL 11TH :—MORNING, 9 TO 12 AND AFTERNOON, 2 TO 5.

1. Describe the various classes of deposits accumulating on the ocean ottoms at the present time, and state their distribution in general terms

2. State what you know concerning the origin of soil. Give illustrations drawn from the Dominion of Canada.

3. Draw up a scheme, showing the classification of the Volcanic Rocks.

4. Of what minerals are the following rocks composed :—*Granite*, *Syenite*, *Theralite*? What are the volcanic equivalents of the two first?

5. Give a sketch of the views of Werner and Hutton respectively. Where did they live and what schools did they found?

6. Distribution and sub-division of the Upper Silurian System in Canada. Name and describe a few of its characteristic fossils.

7. Draw out a scheme, showing the sub-division of the geological column into Periods and Systems. Show where the earliest fishes and the earliest mammals appear.

8. Draw a geological section, showing the age, succession and relation of the strata from the Rocky Mountains to Lake Winnipeg.

9. (*a*) The Laurentian system. Its distribution in Canada. Its origin. What are the chief minerals of economic importance which it contains?

(*b*) State what you know concerning the distribution and sub-divisions of the Jurassic in various parts of the world and of the invertebrate life of that system.

10 State the zoological or botanical relations and the geological range of :—*Trigonia*, *Olenellus*, *Belemnites*, *Eozoon*, *Spirifer*, *Stigmaria*, *Orthoceras*, *Ichthyosaurus*, *Nummilites*, *Psilophyton*.

2 O'CLOCK P.M.

11. Name the fossils exhibited, and state the geological formations to which they belong.

12. Name and describe the rock specimens.

N. B.—Students in Arts will answer 9 (*b*), but will not answer 9 (*a*). Students in Applied Science will substitute 9 (*a*) for 9 (*b*).

B.A. HONOURS IN GEOLOGY AND NATURAL HISTORY.

(SECOND PAPER.) MICROSCOPICAL PETROGRAPHY.

WEDNESDAY, MARCH 28TH:—AFTERNOON, 2 TO 5.

1. Describe in detail the sections lettered A, B and C.

2. Give the name and structure of rock in sections 1 to 8.

B.A. HONOURS IN GEOLOGY AND NATURAL HISTORY.

(THIRD PAPER) PETROGAPHY.

MONDAY, APRIL 2ND:—MORNING, 9 TO 1.

1. Define the term Petrography.

2. To what group of rocks does that constituting Trembling Mountain in the Province of Quebec belong? Describe in detail its microscopical characters and illustrate your descriptions by sketches.

3. Name and describe the structure characteristic of the Plutonic rocks as a class and also that characteristic of the Volcanic rocks.

4. Describe briefly the following: Syenite, Obsidian, Trachyte, Arkose, Diabase.

5. Enumerate all the constituents commonly found in an Olivine Gabbro in the order in which they crystallize out. State the law which governs this order of succession.

6. Describe the progressive changes which take place in clay slate as the contact of a mass of intrusive granite is approached.

7. Describe the appearance under the microscope of a thin section of Baveno granite.

8. What do you understand by the term Inclined Extinction? Illustrate your answer by sketches.

9. Name the fifteen hand specimens. What structures are exhibited by Nos. 13, 14 and 15?

10. Explain the various factors which determine the brilliancy of the colours shown by a thin section of a doubly refracting mineral when examined between crossed nicols.

11. Describe the microscopical characters of Microcline and of Microperthite.

12. Describe the usual course of alteration in the case of the following minerals as seen under the microscope: Olivine, Angite, Pyrite, Biotite, Ilmenite.

13. Examine the five thin sections under the microscope. State in each case what minerals are present, as well as the name and structure of the rock.

N.B.—Students in Arts will omit question 13. Students in Applied Science will substitute question 13 for questions 10, 11 and 12.

B.A. HONOURS IN GEOLOGY AND NATURAL HISTORY.

(FOURTH PAPER) PRACTICAL GEOLOGY AND ORE DEPOSITS.

MONDAY, APRIL 9TH:—MORNING, 9 TO 12.30.

1. Explain the terms—*Synclinal, Creep, Float, Isoclinal, Overlap.*

2. Define the terms *Dip Fault* and *Strike Fault*, and illustrate your definitions by sketches.

3. State what you know concerning the influence of geological structure on water supply.

4. Describe the structure represented by the model exhibited, and mention any well-known district in which this structure is seen on a large scale.

5. Explain the mode of constructing a detailed horizontal section along any line of country from one point to another.

6. Explain the structure of the district represented in the map (No. I).

7. Describe in detail the attitude and relations of the strata along the line of section (No. II).

8. Define the terms—*Gossan, Iron Hat, Hanging Wall, Country Rock, Horse.*

9. Describe the geological relations and mode of occurrence of the gold deposits of Nova Scotia.

10. Give a brief description of the character and mode of occurrence of the argentiferous lead deposits of the Slocan district.

11. Outline briefly the geological history of a placer deposit containing *Stream Tin.*

B.A. HONOURS IN GEOLOGY AND NATURAL HISTORY.

(FIFTH PAPER) ADVANCED GEOLOGY.

SATURDAY, APRIL 14TH:—MORNING, 9 TO 12.

1. Trace out the evolution of the modern horse, and state what you know concerning its ancestors.

2. State what you know concerning the following:—*Loxomma*, *Dolichosoma*, *Teleosaurus*, *Hadrosaurus*, *Coryphodon*.

3. Show how geological influences have affected the course of British History.

4. Give a sketch of the life of Leopold Von Buch and of his services to geological science.

5. Outline the arguments presented by Lyell in refutation of the view that the aqueous forces had acted with much greater intensity at former periods of the earth's history than at present.

6. What do you understand by the expression *Cycles of Deposition*? Give examples from North America. What is the cause of this phenomenon?

7. Describe the Maldiva Archipelago, and explain Darwin's theory concerning its origin.

8. State what you know of the lava fields of North Western Europe, and compare them with similar occurrences elsewhere.

9. Give an account of the contributions made by Agassiz to glacial geology.

10. Explain the influence of regelation on glacier motion.

11. State what you know concerning the evidence afforded by the Cave Mammalia as to the climate of Europe during the Pleistocene.

B.A. HONOURS IN GEOLOGY AND NATURAL HISTORY.

(SIXTH PAPER) CANADIAN GEOLOGY AND ADVANCED GEOLOGY.

TUESDAY, APRIL 17TH:—MORNING, 9 TO 12.30.

1. Describe briefly the following formations, giving geographical distribution and stratigraphical position:—*Banff*, *Utica*, *Potsdam*, *Horton*, *Vancouver*.

2. What evidences are there of pre-Tertiary volcanic activity in Eastern Canada?

3. Describe the Upper Silurian as developed in Ontario.

4. Give the stratigraphical position and petrographical characters of the following formations, and state whether they yield any products of economic value—*Laramie, Grenville, Hamilton, Trenton, Upper Carboniferous.*

5. Name the minerals of economic importance in the Huronian. Describe their mode of occurrence.

6. Refer the three collections of fossils exhibited to their proper formations. Name the fossils.

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7. Describe Niagara Falls, and state what you know concerning their geological history. How has the attempt been made to employ them as a "Geological Chronometer"?

8. State what you know concerning the origin of dolomite.

9. State what you know concerning the origin and nature of soils.

10. Describe briefly the chief physiographical divisions of the United States, and explain their origin.

B.A. HONOURS IN GEOLOGY AND NATURAL HISTORY.

(SEVENTH PAPER) PHYSIOGRAPHY.

THURSDAY, APRIL 19TH:—MORNING, 9 TO 12.30.

1. Describe briefly Prevailing Westerlies, Monsoons, Doldrums, Chinook, Cyclonic Area.

2. State what you know concerning the origin of Lake Basins.

3. Describe the structure of a high grade delta and the conditions under which it is formed.

4. Classify the Land Forms on Maps A and B. What do you know concerning their origin and age?

5. Describe the physical features shown on the model.

6. Make notes descriptive of Monadnock, Drumlin, Mesa, Antecedent River, Peneplain. Illustrate by sketches.

7. Define climate. What factors should be considered in connection with the climate of Montreal?

8. What work of geographical importance was done by Humbolt, Strabo, Eratosthenes, Varennius, Ritter.

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FIRST YEAR SESSIONAL EXAMINATIONS.

ENGLISH.

TUESDAY, APRIL 3RD:—MORNING, 9 TO 12.

A.

1. Indicate and illustrate your method of treatment of any given subject.

2. Show, briefly, the importance of punctuation, and give what you consider to be guiding principles in the subject.

3. Write, briefly, upon the value of *clearness*. Indicate some of the most frequent violations of this principle.

4. (*a*) What is a paragraph and what are the essentials of a good paragraph? (*b*) Write very briefly on *style*.

5. Mention the different sub-divisions of style, and state how you would give to a sentence the quality of "*Force*."

6. Make brief notes on:

(*a*) *Periodic and loose sentences.*
(*b*) *Synonyms.*
(*c*) *Unity in the sentence.*
(*d*) *Good Use.*

B.

Write a short essay on any one of the following topics:

Canadians in the Transvaal.
McGill as an Educational Centre.
Canadian Winter Sports.
The Island of Montreal.

THIRD YEAR SESSIONAL EXAMINATIONS.

GEOLOGY.

WEDNESDAY, APRIL 11TH:—MORNING, 9 TO 12 AND AFTERNOON, 2 TO 5.

1. Describe the various classes of deposits accumulating on the ocean bottoms at the present time, and state their distribution in general terms.

2. State what you know concerning the origin of soil. Give illustrations drawn from the Dominion of Canada.

3. Draw up a scheme, showing the classification of the Volcanic Rocks.

4. Of what minerals are the following rocks composed:—*Granite*, *Syenite*, *Theralite*? What are the volcanic equivalents of the two first?

5. Give a sketch of the views of Werner and Hutton respectively. Where did they live and what schools did they found?

6. Distribution and sub-division of the Upper Silurian System in Canada. Name and describe a few of its characteristic fossils.

7. Draw out a scheme, showing the sub-division of the geological column into Periods and Systems. Show where the earliest fishes and the earliest mammals appear.

8. Draw a geological section, showing the age, succession and relation of the strata from the Rocky Mountains to Lake Winnipeg.

9. (*a*) The Laurentian system. Its distribution in Canada. Its origin. What are the chief minerals of economic importance which it contains?

(*b*) State what you know concerning the distribution and sub-divisions of the Jurassic in various parts of the world and of the invertebrate life of that system.

10. State the zoological or botanical relations and the geological range of:—*Trigonia*, *Olenellus*, *Belemnites*, *Eozoon*, *Spirifer*, *Stigmaria*, *Orthoceras*, *Ichthyosaurus*, *Nummilites*, *Psilophyton*.

2 O'CLOCK P.M.

11. Name the fossils exhibited, and state the geological formations to which they belong.

12. Name and describe the rock specimens.

N. B.—Students in Arts will answer 9 (*b*), but will not answer 9 (*a*). Students in Applied Science will substitute 9 (*a*) for 9 (*b*).

B.Sc. EXAMINATION, GEOLOGY AND NATURAL HISTORY.

(THIRD PAPER) PETROGRAPHY.

MONDAY, APRIL 2ND:—MORNING, 9 TO 1.

1. Define the term Petrography.

2. To what group of rocks does that constituting Trembling Mountain in the Province of Quebec belong? Describe in detail its microscopical characters and illustrate your descriptions by sketches.

3. Name and describe the structure characteristic of the Plutonic rocks as a class and also that characteristic of the Volcanic rocks.

4. Describe briefly the following: Syenite, Obsidian, Trachyte, Arkose, Diabase.

5. Enumerate all the constituents commonly found in an Olivine Gabbro in the order in which they crystallize out. State the law which governs this order of succession.

6. Describe the progressive changes which take place in clay slate a the contact of a mass of intrusive granite is approached.

7. Describe the appearance under the microscope of a thin section of Baveno granite.

8. What do you understand by the term Inclined Extinction? Illustrate your answer by sketches.

9. Name the fifteen hand specimens. What structures are exhibited by Nos. 13, 14 and 15?

10. Explain the various factors which determine the brilliancy of the colours shown by a thin section of a doubly refracting mineral when examined between crossed nicols.

11. Describe the microscopical characters of Microcline and of Microperthite.

12. Describe the usual course of alteration in the case of the following minerals as seen under the microscope: Olivine, Augite, Pyrite, Biotite, Ilmenite.

13. Examine the five thin sections under the microscope. State in each case what minerals are present, as well as the name and structure of the rock.

N.B.—Students in Arts will omit question 13. Students in Applied Science will substitute question 13 for questions 10, 11 and 12.

B.Sc. EXAMINATION.

GEOLOGY AND NATURAL HISTORY.

(FOURTH PAPER) PRACTICAL GEOLOGY AND ORE DEPOSITS.

MONDAY, APRIL 9TH :—MORNING, 9 TO 12.30.

1. Explain the terms—*Synclinal*, *Creep*, *Float*, *Isoclinal*, *Overlap*,

3. Define the terms *Dip Fault* and *Strike Fault*, and illustrate your definitions by sketches.

3. State what you know concerning the influence of geological structure on water supply.

4. Describe the structure represented by the model exhibited, and mention any well-known district in which this structure is seen on a large scale.

5. Explain the mode of constructing a detailed horizontal section along any line of country from one point to another.

6. Explain the structure of the district represented in the map (No. I).

7. Describe in detail the attitude and relations of the strata along the line of section (No. II).

8. Define the terms—*Gossan*, *Iron Hat*, *Hanging Wall*, *Country Rock*, *Horse*.

9. Describe the geological relations and mode of occurrence of the gold deposits of Nova Scotia

10. Give a brief description of the character and mode of occurrence of the argentiferous lead deposits of the Slocan district.

11. Outline briefly the geological history of a placer deposit containing *Stream Tin*.

B.Sc. EXAMINATION.

GEOLOGY AND NATURAL HISTORY.

(FIFTH PAPER) CANADIAN GEOLOGY AND ADVANCED GEOLOGY.

TUESDAY, APRIL 17TH :—MORNING 9 TO 12.30.

1. Describe briefly the following formations, giving geographical distribution and stratigraphical position :—*Banff*, *Utica*, *Potsdam*, *Horton*, *Vancouver*,

2. What evidences are there of pre-Tertiary volcanic activity in Eastern Canada ?

3. Describe the Upper Silurian as developed in Ontario.

4. Give the stratigraphical position and petrographical characters of the following formations, and state whether they yield any products of economic value—*Laramie, Grenville, Hamilton, Trenton, Upper Carboniferous.*

5. Name the minerals of economic importance in the Huronian. Describe their mode of occurrence.

6. Refer the three collections of fossils exhibited to their proper formations. Name the fossils.

7. Describe Niagara Falls, and state what you know concerning their geological history. How has the attempt been made to employ them as a "Geological Chronometer?"

8. State what you know concerning the origin of dolomite.

9. State what you know concerning the origin and nature of soils.

10. Describe briefly the chief physiographical divisions of the United States, and explain their origin.

THIRD YEAR HONOURS IN GEOLOGY AND MINERALOGY (CHEMISTRY AND MINING COURSES).

MINERALOGY.

THURSDAY, APRIL 19TH:—MORNING, 9 TO 12.

1. Discuss the classification of mineral species and give a classification based upon chemical composition.

2. How are the positions of crystal faces determined mathematically ?

3. Give the characteristics of the Monoclinic System of Crystallography, explaining carefully the notation of the faces.

4. Name and briefly characterize the principal imitative shapes found among minerals.

5. Explain the distinction between uniaxial and biaxial crystals.

6. What are pseudomorphs, and in what ways are they produced ?

7. Name some of the principal Sulphantimonites, and describe on of them.

8. State what you know with regard to the chemical composition and crystalline form of the following species :—Marcasite, Molybdenite, Proustite, Manganite, Rutile, Pyroxene.

9. Explain the relationship of Metasilicates, Orthosilicates and Polysilicates.

10. Describe two of the crystal models shown, giving symbols for the faces. Name also and describe any five of the mineral specimens.

B.Sc. HONOURS IN NATULAL SCIENCE, CHEMISTRY AND MINING COURSES.

FIRST PAPER—MINERALOGY.

WEDNESDAY, DECEMBER 20TH :—MORNING, 9 TO 12.

1. Give any striking illustrations of the intimate relationship between chemical composition and physical properties in minerals.

2. A mineral was found on analysis to have the following percentage composition :—Silica 36.16, Alumina 20.12, Ferric Oxide 0.30, Ferrous Oxide 10.44, Manganous Oxide 32.18, Magnesia 0.22, Lime 0.58. Calculate its quantivalent ratio and formula. To what species does the mineral be long ?

3. Give the characters of the Tetragonal System of Crystallography including symbols or indices of planes.

4. Explain any five of the following terms :—Dimorphism, Pseudomorphism, Oscillatory Combination, Axial Figure, Percussion Figure, Polysilicate.

5. State what you know with regard to the crystallization of the following species :—Leucite, Zircon, Topaz, Pyroxene, Apatite.

6. Explain twinning as it occurs (*a*) in Staurolite, (*b*) in Titanite, (*c*) in Orthoclase.

7. How would you distinguish Arsenopyrite from Pyrite, Chalcocite from Tetrahedrite, Cuprite from Zincite, Menaccanite from Franklinite ?

8. Give the general characters (*a*) of the Feldspars and (*b*) of the Scapolites.

9. Give brief descriptions of each of the following species:—Bornite, Pyrolusite, Stilbite, Pyromorphite, Malachite.

10. Give an account of the mode of occurrence in nature of the Native Metals:—Gold, Platinum, Silver, Copper.

Specimens:—AFTERNOON, 2 TO 4.

Name the minerals exhibited, and give their characters *as seen in the specimens.*

THIRD YEAR HONOURS IN NATURAL SCIENCE.

MINING COURSE AND PRACTICAL CHEMISTRY COURSE DETERMINATIVE MINERALOGY.

SATURDAY, APRIL 21ST:—MORNING, 9 TO 11.

1. How are the oxidising and reducing flames produced by means of the ordinary mouth-blowpipe? Describe these flames and tell upon what facts their peculiarities depend.

2. What is meant by the term "roasting," as applied in blowpipe analysis? Describe minutely how the operation is best performed, and point out the chemical changes involved.

3. Mention the principal reactions employed in determinative mineralogy of any six of the following elements; antimony, boron, copper, fluorine, manganese, phosphorus, sulphur, titanium.

4. Describe the operation of "heating in the open tube," and mention the more important reactions obtained in this way, and what they indicate.

5. Describe carefully how the specific gravity of a mineral is determined.

6. Make notes upon any three of the following terms, as employed in determinative mineralogy: cleavage, hardness, lustre, streak, fusibility.

7. Give the most important determinative characters of the following minerals: analcite, brucite, franklinite, halite, niccolite, pyrrhotite, zircon.

Practical determination of minerals in the Mineralogical Laboratory.

THIRD YEAR (CHEMISTRY COURSE).

PRACTICAL CHEMISTRY.

MONDAY, APRIL 16TH :—MORNING, 9 TO 12.

1. Describe briefly the Iodine method for the valuation of Manganese Ores. What weight of Potassium Iodide would be just sufficient to absorb the Chlorine evolved when 0.50 grm. of Pyrolusite (containing 85 per cent. MnO_2) is dissolved in Hydrochloric Acid?

2. Classify the methods employed for the estimation of Carbon in Iron and Steel. Describe the colorometric method, calling attention to possible sources of error.

3. Describe the estimation of Manganese in Steel by the Ford-Williams method. How would you modify the method in the case of Pig Iron?

4. How would you determine the Silica and Lime in a blast furnace Slag?

5. How may Lead be estimated (*a*) gravimetrically, or (*b*) volumetrically?

6. How many c.c. of a solution of Potassium Permanganate containing 5 grams to a litre of Water would be required to oxydise the Oxalic Acid in 0.50 grm. of Calcium Oxalate?

7. One gram of Limestone was dissolved in 25 c.c. of normal Hydrochloric Acid, and 6.2 c.c. of normal Alkali solution were required to neutralise the remaining free acid. What was the percentage of Lime in the Limestone?

8. Describe the Cyanide method for the estimation of Copper, pointing out any sources of error.

9. How would you determine the amount of Hydrogen Sulphide in a Spring Water containing that gas?

10. What do you understand by the Basic Acetate process for the separation of Iron from Manganese, etc.? Describe it briefly.

B.Sc. (CHEMISTRY COURSE).

PRACTICAL CHEMISTRY.

THURSDAY, APRIL 5TH:—MORNING, 9 TO 12.

1. Discuss the interpretation of the results obtained in the sanitary analysis of Water.

2. Describe Pearce's method for the determination of Arsenic.
In the estimation of Arsenic in an ore by this method, one gram of the ore was employed. 1 c.c. of the Ammonium Sulphocyanate solution corresponded to 0.008 grm. of Silver, and for the titration of the Silver Arsenate 45 c.c. were required. What was the percentage of Arsenic in the ore?

3. Describe the volumetric estimation of Phosphorus in Steel, carefully explaining the theory of the method.

4. Explain the use of the electric current in the oxydation of Chrome Iron Ore.

5. Describe the estimation of Copper by the Iodide process, explaining the reactions that take place by means of equations.

6. How would you determine the proportions of graphitic and combined Carbon in Pig Iron?

7. How may Lead be estimated electrolytically? Point out any defects in the method.

8. 0.213 gram of an organic compound containing Carbon, Hydrogen and Oxygen yielded on combustion 0.566 grm. of CO_2 and 0.265 grm. of H_2O. Calculate the empirical formula of the compound.

9. Describe the preparation of pure Aniline from commercial Benzene, and of pure Benzene from the Aniline.

10. What is Sulphanilic Acid? How is it prepared and what are its properties?

THIRD AND FOURTH YEAR APPLIED SCIENCE.

ORGANIC CHEMISTRY.

SATURDAY, APRIL 7TH:—MORNING, 9 TO 12.

1. Explain fully what is meant by empirical, constitutional and graphic ormulæ. Give examples. The percentage composition of a monobasic atty acid is $C = 39.95$, $H = 6.69$, $O = 53.36$. and $0.296g$ of the silver salt gave on ignition $0.162g$ of silver. What is the molecular formula of the acid?

2. Describe a method for the quantitative estimation of chlorine in an organic substance.

3. How may pure ethane be prepared? Discuss briefly the general properties of the paraffins.

4. What are the alkylhalides? Describe the preparation of any member of this group and indicate by examples their use in organic synthesis.

5. Write a short account of the commercial preparation of methyl alcohol and tell how its constitutional structure has been established.

6. State how you would prepare the following substances from ethyl alcohol: (*a*) Iodoform, (*b*) Acetaldehyde, (*c*) Normal propyl alcohol, (*d*) Isopropyl alcohol.

7. Define clearly the terms saponification, hydrolysis, condensation, polymerisation. Illustrate your answers by examples.

8. What are sulphonic acids? How are the fatty sulphonic acids obtained? What changes do these undergo on treatment with (*a*) Nascent hydrogen (*b*) Caustic potash?

B.Sc. EXAMINATION (CHEMISTRY COURSE)

INORGANIC CHEMISTRY.

MONDAY, APRIL 16TH:—MORNING, 9 TO 12.

1. Give the preparation and properties of (*a*) Hydriodic Acid, (*b*) Disulphuric Acid, (*c*) Orthoboric Acid.

2. Discuss the constitution of the compounds of Nitrogen with Oxygen and Hydrogen.

3. Explain the constitution of acid and basic salts, giving examples.

4. Illustrate by means of equations the chemical changes that take place in the manufacture of Phosphorus from Calcium Phosphate.

5. Describe the preparation and properties of Hydrogen Dioxide, giving illustrations of its action (*a*) as an oxydising, and (*b*) as a reducing agent.

6. Explain the constitution and relationship of the different Phosphorus Acids. Point out also any analogies existing between these and the members of other series of acids.

7. Describe the preparation and properties of Potassium Ferrocyanide. How is this salt converted into the corresponding Ferricyanide? What are the properties of the latter?

8. What volume of Carbon Dioxide at 15° C. and 750 mm. can be obtained from a cubic decimetre of marble (sp. gr. 2.70)

9. What do you understand by Aluminates, Chloraluminates and Fluoaluminates?

10. Give the formulæ and preparation of the different Oxides of Lead.

11. How would you prepare (*a*) the Chlorides and (*b*) the Nitrates of Mercury?

ECOND YEAR

ANALYTICAL CHEMISTRY.

MONDAY, APRIL 2ND :—AFTERNOON, 2 TO 5.

1. What are the principal methods of examining substances in the dry way? Mention the more important reactions obtained by any one of these methods, and point out their significance.

2. An alloy is submitted for examination: how is it brought into solution in order to submit it to the ordinary course of analysis?

3. Describe carefully the precipitation of metals of the copper and arsenic groups by means of sulphuretted hydrogen, mentioning the principal difficulties that are liable to be met with in effecting a complete separation, and the precautions to be observed in overcoming these difficulties.

4. Describe carefully the separation of the sulphides of arsenic, antimony and tin from those of the metals of the copper group when all have been precipitated together, giving reasons for each step.

5. Point out very carefully the reasons why the short method for the separation of iron, manganese, zinc and aluminium cannot be adopted when chromium and phosphoric acid are present in the solution.

6. How may the presence or absence of chromium and phosphoric acid be determined with certainty in the filtrate from the precipitate produced by sulphuretted hydrogen in the ordinary course of analysis?

7. A mixture of barium, strontium and calcium carbonates is obtained by precipitation with ammonium carbonate; describe carefully the separation of the metals.

8. Into what groups are the ordinary inorganic acids divided for purposes of analysis; upon what reaction is the division based; and what are the members of each group?

9. What are the most important reactions of the following acids: Sulphuric, chromic, hydrofluoric, hydrochloric, hydriodic, nitric

10. A mixture of the sodium salts of the following acids is submitted fo analysis for acids: carbonic, hydrochloric, phosphoric, nitric. Describ carefully the course of its analysis and what results will be obtained during the work.

11. What do you consider to be the commonest causes of errors in qualitative analysis, and how may they be avoided?

THIRD YEAR

MINING COURSE.

ANALYTICAL CHEMISTRY.

SATURDAY, 7TH APRIL:—MORNING, 9 TO 12.

1. Describe carefully the separation of a precipitate from the liquid from which it has separated, pointing out the precautions necessary to make the separation as complete as possible.

2. What precautions are necessary in the ignition and weighing of precipitates, as carried out in ordinary gravimetric analysis?

3. What do you consider to be the commonest causes of error in gravimetric analysis, and how may they be avoided?

4. How may the percentage of iron in ferrous ammonium sulphate be determined?

5. Describe the quantitative separation of the more important constituents of a dolomite.

6. Describe the determination of the ammonium in a sample of sal-ammoniac *or* of the antimony in a sample of tartar emetic.

7. State accurately what is meant by a normal solution, and describe the preparation of normal sodium carbonate.

8. Given a solution of $\frac{1}{5}$ normal sodium carbonate, how may a semi-normal solution of sulphuric acid be prepared?

B.Sc. EXAMINATION (MINING COURSE).

ASSAYING.

SATURDAY, APRIL 14TH:—AFTERNOON, 2 TO 5.

1. In the examination of a sample of Chrome Iron Ore by the Sodium Peroxide method, 0.25 grm. of the ore was used and the solution made up to 50 c.c. 58.5 c.c. of this solution were required to oxydise the Ferrous Iron in 0.20 grm. of Ferrous Ammonium Sulphate. What percentage of Chromium Sesquioxide would the ore yield?

2. Compare the Permanganate and Dichromate methods for the volumetric estimation of Iron in ores, pointing out the relative advantages and disadvantages of each.

3. How would you estimate the Ferrous Iron in an Iron Ore?
If the ore were insoluble in Hydrochloric Acid, how would you modify the process?

4. Describe the volumetric estimation of Zinc with Potassium Ferrocyanide, explaining the theoretical points involved in the process.

5. How would you estimate the amount of Copper in an ore by the Iodide process? Explain the chemical changes by means of equations.

6. Describe either the estimation of Phosphorus in Steel *or* the estimation of Manganese in a Bog Iron Ore.

7. Give method, amounts of ore and amounts of fluxes you would use in assaying the following for Silver:—

(*a*) $FeS_2 + Cu_2S$. (*b*) Limestone.
(*c*) $PbS + FeS_2 + ZnS$. (*d*) $SiO_2 + Sb_2S_3 + As_2S_3$.

8. Compare methods in which Nitre and Iron are used respectively. What ores are adapted to each?

9. Give a concise description of the Lead fire-assay, and causes of error in the assay. What amounts of ore and fluxes would you use to assay (*a*) $PbS + FeS_2$. (*b*) $PbCO_3 + CaCO_3$. (*c*) PbO.

10. A sample of ore weighing $2\frac{53}{100}$ kilos. was received for assay. The whole was put through a 100-mesh sieve and gave in pellets

0.0506 grm. of gold. The ore weighed $2\frac{852}{1000}$ kilos. after passing through the 100-mesh sieve.

$\frac{1}{10}$ A. T. gave { 0.0635 grm. Silver. / 0.0012 " Gold.

What was assay of ore in ounces per ton of both Gold and Silver?

B.Sc. EXAMINATION.

ELECTRO-CHEMISTRY.

MONDAY, APRIL 2ND :—AFTERNOON, 2 TO 5

1. By what means can the osmotic pressure of an aqueous solution be measured? What is the cause of osmotic pressure?

2. Describe two methods by which the osmotic pressures of solutions can be indirectly compared with each other, and the molecular weights of the dissolved substances determined.

3. What class of substances give an abnormal value for the osmotic pressure, and in what way is this connected with electrolytic phenomena?

4. What reasons have we for concluding that the passage of electricity through a solution is attended with the transport of material particles in opposite directions?

5. What are the various substances obtainable from common salt by its electrolytic decomposition? How can some of them be quantitatively estimated and the efficiency of the process determined?

6. Describe a process for the electrolytic separation of antimony from Stibnite (Sb_2S_3).

7. Describe the preparation of calcium carbide and of carborundum. What are their properties and their technical application?

8. What is the electro-chemical theory of the action which takes place in charging and discharging an accumulator?

9. Describe in detail the preparation of any standard cell.

FIRST YEAR.

MATHEMATICS I.

TUESDAY, DECEMBER 19TH :—MORNING, 9 TO 1.

1. Divide a straight line into two parts, so that (*a*) the sum, (*b*) the difference of the squares on the two parts may be equal to a given area.

2. Three times the sum of the squares on the sides of a triangle equals four times the sum of the squares on the medians.

3. If from a point without a circle a secant and a tangent be drawn, the rectangle contained by the secant and its external segment shall be equal to the square on the tangent.

Hence show that if two circles intersect, their common chord produced bisects their common tangent.

4. Two circles touch a given straight line at two given points and also touch one another; find the locus of their point of contact.

5. Find the radii of the inscribed and escribed circles of a triangle in terms of the sides.

Prove that the square root of their product is equal to the area of the triangle.

6. Prove by two independent methods that the bisector of the vertical angle of a triangle cuts the base, so that the segments have the same ratio to each other that the sides have.

7. Every plane passing through a perpendicular to a plane is also perpendicular to that plane.

8. Find the common perpendicular to two straight lines not in the same plane.

9. In how many ways may a solid angle be formed (*a*) with equilateral triangles, (*b*) with squares?

10. Find the volume:

(*a*) Of an oblique triangular prism.

(*b*) Of a right circular cone.

Where must a plane parallel to the base of the latter be taken so as to divide it into two equal parts?

11. In a parabola:

(*a*) Tangents at the extremities of a focal chord intersect at right angles in the directrix.

(*b*) The rectangle contained by the ordinates at the extremities of a focal chord equals the square on half the latus rectum.

(*c*) The subnormal is constant.

(*d*) The sum or the difference of the distances of any point on the curve to the focus and to a chord cutting the axis at right angles is constant.

12. What is meant by the eccentricity of an ellipse? Show by a figure whether it is greater or less than 1.

13. Find the locus of the centres of circles which touch a given circle and a given straight line.

FIRST YEAR.

MATHEMATICS, II.

MONDAY, APRIL 2ND: —MORNING, 9 TO 12.30.

1. Factor (1) $x^3 - 18\,xyz - 8y^3 - 27z^3$

(2) $x^3 + 6x^2 - 13x - 42$

(3) $(a-b)^3 + (b-c)^3 + (c-a)^3$.

2. Solve

(1) $\left.\begin{array}{l} x^3 + 1 = 9y \\ x^2 + x = 6y \end{array}\right\}$

(2) $\dfrac{x}{x+1} + \dfrac{x+1}{x+2} + \dfrac{x+2}{x+3} = 3$

(3) $\sqrt{x} - \sqrt{4-x} = \sqrt{4-3x}$

3. Find the square root of $15 + 5\sqrt{8}$.

4. Find a mean proportional between $x^2 - \dfrac{1}{y^2}$ and $y^2 - \dfrac{1}{x^2}$

5. Show that $\dfrac{x^{\frac{2}{3}} - 4\sqrt[3]{x^{-2}}}{\sqrt[3]{x^2} + 4 + 4x^{-\frac{2}{3}}} = \dfrac{x^{\frac{2}{3}} - 2}{x^{\frac{2}{3}} + 2}$

6. If α and β are the roots of

$$px^2 + qx + r = 0$$ show that

$$\frac{1}{\alpha} + \frac{1}{\beta} + \frac{q}{r} = 0.$$

7. Find the sum of 8 terms of the following series

(1) $(a+b)^2 + (a^2+b^2) + (a-b)^2 + \ldots\ldots\ldots$

(2) $\frac{2}{3} + \frac{1}{3} + \frac{1}{2} + \ldots\ldots\ldots$

(3) $3 + 1\frac{1}{2} + 1 + \ldots\ldots\ldots$

8. If the sum of a Geometrical Progression to infinity is n times the first term, show that the common ratio is $1 - \frac{1}{n}$.

9. Find n from (1) ${}^{n}P_{6} = 12 \times {}^{n}P_{4}$

(2) ${}^{2n}C_{3} = 12 \times {}^{n}C_{2}$

10. Out of 8 consonants and 5 vowels how many words can be made, each containing 4 consonants and 3 vowels ?

11. Deduce a formula for finding the greatest term in $(x + a)^{n}$. Which is it and what is its value when $x = 5$, $a = 3$ and $n = 16$?

12. Find by means of the Binomial Theorem the value of $\sqrt[7]{130}$ to 4 places of decimals.

13. Show that the $r + 1^{th}$ term of

$$(1 - x)^{-4} = \frac{(1 + r)\ (2 + r)\ (3 + r)}{1.2.3}\ x^{r}.$$

FIRST YEAR.

MATHEMATICS, III.

TUESDAY, APRIL 10TH :—MORNING, 9 TO 1.

1. Show that (1) $\tan^{2}\theta - \sin^{2}\theta = \sin^{4}\theta \sec^{2}\theta$

(2) $\sec 72° - \sec 36° = 2$

(3) $\cot\theta - \tan\theta = 2 \cot 2\theta$

(4) $\sin 2\theta = 2 \sin\theta \cos\theta$

(5) $\sin 3 = 3 \sin\theta - 4 \sin^{3}\theta$

(6) $\sin 5 = 5 \sin\theta - 20 \sin^{3}\theta + 16 \sin^{5}\theta$

2. Solve (1) $\tan\theta + \sec\theta = 2$

(2) $\sin 2\theta - \cos 2\theta = \cos\theta - \sin\theta$

3. Show that $\sin^{-1}\frac{3}{5} + \sin^{-1}\frac{4}{5} = 2\left(\tan^{-1}\frac{1}{4} + \tan^{-1}\frac{1}{3}\right)$.

4. Show that in any plane triangle

(1) $a^{2} = b^{2} + c^{2} - 2bc \cos A$

(2) $(b - c) \cos \frac{A}{2} = a \sin \frac{B - C}{2}$

(3) $\sin 2A + \sin 2B - \sin 2C - 4 \sin C \cos A \cos B$

5. In any right-angled spherical triangle show that

(1) $\cos c = \cos a \cos b$

(2) $\cos^2 A + \sin^2 A \sin^2 b = \sin^2 B$

(3) The hypotenuse is greater than 90° when the sides are of different species.

. In any spherical triangle show that

(1) $\cos a = \cos b \cos c + \sin b \sin c \cos A$

(2) $S - A < 90°$

(3) Area = (spherical excess) $\times \frac{\pi r^2}{180}$

7. In the plane triangle in which

$a = 562,\ b = 320,\ c = 800$

show that $A = 33°\ 35',\ B = 18°\ 21',\ C = 128°\ 4'$

8. In the spherical triangle in which

$A = 95°\ 38'\ 4'',\ B = 65°\ 33'\ 10'',\ a = 99°\ 40'\ 48''$

Show that

$b = 64°\ 23'\ 15'',\ c = 100°\ 49'\ 30'',\ C = 97°\ 26'\ 29''$

FIRST YEAR.

MATHEMATICS, IV.

SATURDAY, APRIL 14TH:—MORNING, 9 TO 12.

1. Find the resultant of velocities 7 and 15 at an angle of 120°.

2. From a gun weighing 8 lbs. is fired a one-ounce bullet with a velocity of 1000 feet per second. What is the velocity of the gun's recoil?

3. Show that the kinetic energies of the gun and bullet of question 2 are 7.63 and 976.57 foot-pounds, respectively.

4. A body is thrown directly upwards with a velocity V; how long before it will return to the starting point, and how far will it have travelled?

5. A string is tied to a body of mass 8 lbs. lying on a rough horizontal table (coefficient of friction $\frac{1}{4}$) ; the string passes over a smooth pulley at the edge of the table and supports a mass of 12 lbs. hanging vertically. Show that the velocity at the end of one second will be $\frac{1}{2}$ g, and that the tension of the string is equal to a force of 6 pounds.

6. Two strings, one of which is horizontal and the other inclined to the vertical at an angle of 30°, support a weight of 10 lbs. Find the tension of each string.

7. A body of given weight W is supported on a plane of inclination θ by a force acting up the plane. Show that the force is $W \sin \theta$, and the reaction of the plane $W \cos \theta$.

8. Find the force which, acting up an inclined plane, will keep a weight of 10 lbs. in equilibrium ; it being given that the force, the pressure on the plane, and the weight are in arithmetical progression.

9. A cylindrical jar is immersed mouth downward in water. How far below the surface is the top of the water in the jar when the jar is three quarters full of water ?

10. If the specific gravity of ice is ·925 and that of sea-water 1·025, what action of the volume of an iceberg is above the water ?

11. Ten litres of a liquid of specific gravity $\frac{4}{5}$ is mixed with 6 litres of a liquid of specific gravity $1\frac{1}{2}$; what is the specific gravity of the mixture, assuming that there is no change of volume ?
If the specific gravity of the mixture is 1·1, what is the change of volume ?

12. Each foot-length of the barrel of a suction pump will hold a gallon of water. Find the tension of the piston-rod when the water has risen five feet above the well.

SECOND YEAR.

MATHEMATICS, I.

WEDNESDAY, DECEMBER 20TH :—MORNING, 9 TO 12.30.

1. The angular points of a triangle are (4, — 2), (—2, 4), (6, 2) :—
   (1) Find the co-ordinates of the orthocentre.
   (2) Find those of the centre of the circumscribed circle.
   (3) Show that the length of the line joining these points is $\sqrt{10}$.

2. Given the circles
$x^2 + y^2 + 5x - 3y + 4 = 0$ and $x^2 + y^2 - 4x - 6y - 3 = 0$, find :—

(1) The equation of the common chord.

(2) The ratio of the areas.

(3) The length of the tangent from the origin to the first circle.

(4) The equation of the circle passing through the origin and the points common to the given circles.

3. For what two points on the parabola $y^2 = 4px$ is the normal equal to the latus rectum?

4. The rectangle contained by the ordinates at the extremities of a focal chord of a parabola is constant.

5. Give the definition of an ellipse, and from it deduce the equation of the curve.

6. Find the equation of a tangent to the ellipse $x^2 + 6y^2 = 6$, which is parallel to the line $2x - y = 3$.

7. The perpendicular distance of a focus of a hyperbola from an asymptote is equal to half the conjugate diameter.

8. The locus of the foot of the perpendicular from the centre of the equilateral hyperbola $x^2 - y^2 = a^2$ on the tangent is the curve $(x^2 + y^2)^2 = a^2(x^2 - y^2)$.

9. Turn the axes of the curve $(x^2 + y^2)^2 = a^2(x^2 - y^2)$ through $-45°$, then change to polar co-ordinates, getting $r^2 = a^2 \sin 2\theta$, and hence sketch the curve.

10. Find a new origin so that the curve $4x^2 + 15xy - 4y^2 + 8x + 15y = 0$, when referred to parallel axes, shall contain no terms of the first degree.

SECOND YEAR.

MATHEMATICS, II.

TUESDAY, APRIL 10TH:—MORNING, 9 TO 12.30.

1. Show that:

(1) $d\left(\frac{ax}{a^2 + x^2} + \tan^{-1}\frac{x}{a}\right) = \frac{2a^3\,dx}{(a^2 + x^2)^2}$,

(2) $d\left[x + \log\cos\left(\frac{\pi}{4} - \right)\right] = \frac{dx}{+\tan x}$,

(3) $d \cos \left(\frac{1-x^2}{1+x^2}\right) = \frac{2\,dx}{1+x^2}$.

2. Show that:

(1) $\int_1^2 (4x^2+1)\,dx = 10.333$, (4) $\int_0^{\frac{1}{4}\pi} \sin\theta\, d\theta = .293$,

(2) $\int_1^2 \frac{dx}{4x^2+1} = .109$, (5) $\int_0^{\frac{1}{4}\pi} \sin^2\theta\, d\theta = .143$,

(3) $\int_1^2 \frac{dx}{\sqrt{4x^2+1}} = .326$, (6) $\int_0^{\frac{1}{4}\pi} \sin^3\theta\, d\theta = .077$.

3. Also that:

(1) $\int x^2 \cos x\, dx = (x^2-2)\sin x + 2x\cos x$,

(2) $\int \frac{(x+1)\,dx}{x^3-2x^2+x-2} = \frac{3}{5}\log\frac{x-2}{\sqrt{x^2+1}} - \frac{1}{5}\tan^{-1}x$.

4. Find the equations of the tangent and normal at the point (2, 2) on the curve $x^3+y^3 = x^4$.

5. Find the three asymptotes of the curve $xy^2-ay^2 = x^3$.
What kind of a double point is the origin?

6. The height of the greatest cone which can be cut out of a given sphere is $\frac{2}{3}$ of the diameter of the sphere.

7. Sketch the curve $y^2(a^2+x^2) = a^4$ and show that:

(1) At the points of inflexion $x = \pm\frac{a}{\sqrt{2}}$.

(2) $x^2+y^2 = a^2$ is a circle of curvature.

(3) The area between curve and $x = \pm a$ is $4a^2\log(1+\sqrt{2})$.

(4) The volume formed by revolving the whole area about the asymptote is $\pi^2 a^3$.

(5) The moment of inertia of the whole area with regard to the asymptote $= \frac{4}{3} m a^4$, where m is the mass per unit area.

8. The moment of inertia of a circular annulus about a normal axis through the centre is $m\frac{R^2+r^2}{2}$, where R and r are the greatest and least radii, respectively, and m is the mass of the annulus.

SECOND YEAR.

MATHEMATICS, III.

SATURDAY, APRIL 14TH :—MORNING, 9 TO 12.30

1. Define the hodograph of a moving particle. Prove that the velocity in the hodograph is equal to the acceleration of the moving particle.

When the hodograph is a straight line described with uniform speed, what do you infer as to the force acting on the particle?

2. A rifle bullet loses $\frac{1}{20}$th of its velocity in passing through a plank; and how many such uniform planks it would pass through before coming to rest, assuming the resistance of the planks to be uniform.

3. A steam hammer of mass 2 tons falls through 5 feet, being also pressed down by a steam pressure equal to the weight of 3 tons. What velocity will it acquire and how many foot-pounds of work will it do before coming to rest?

4. Obtain the equation of the path of a projectile.

How do you find the angle of elevation when the velocity of projection and horizontal range are given?

Show that the problem admits of two solutions.

5. Find the time of one revolution of a conical pendulum. Show that it is approximately equal to $\frac{1}{2}\sqrt{5h}$.

What simple pendulum will oscillate in the same time?

6. A 60 ton locomotive is running at 15 miles per hour on a level track round a curve of 3300 feet radius. Find the lateral pressure on the rails.

How much should the outer rail be elevated in order that there may be no lateral pressure?

7. Show graphically that the sum of the moments of any two forces about a point in their plane is equal to the moment of the resultant about the same point.

8. At the vertices of a triangle are applied three parallel forces proportional to the opposite sides. Show that the centre of parallel forces is at the centre of the inscribed circle.

9. A square lamina whose weight is 10 lbs. has attached to its angular points particles whose weights taken in order are 3, 6, 5 and 1 lbs. respectively.

Find the centre of gravity of the system if the side of the lamina is 25 inches.

10. In the accompanying figure find by two independent methods
(1) The stress in the tie XY.
(2 The Reaction at O.
(3) The counter weight at X.
Also find the nature and amount of the stress in YZ.

THIRD YAER.

MATHEMATICS, I.

WEDNESDAY, DECEMBER 20TH:—MORNING, TO 12.30.

1. The squares of a pair of conjugate semi-diameters of an ellipse are $a^2 - e^2 x^2$ and $b^2 + e^2 x^2$.

2. Find the co-ordinates of the centre of gravity of a tetrahedron whose angular points are (x_1, y_1, z_1), (x_2, y_2, z_2), etc.

3. Given the conic $8x^2 - 5xy - 4y^2 + 1 = 0$, find:—

(1) The angle which the principal diameters make with the co-ordinate axes.

(2) The equation referred to these diameters.

4. Reduce the parabola $x^2 - 4xy + 4y^2 - 2x - y + 5 = 0$ to $y^2 = \frac{1}{\sqrt{5}}(x - \sqrt{5})$, and sketch the curve.

5. By the substitution $\tan\theta = z$ show that

$$\int \frac{d\theta}{\sin^4\theta \cos^2\theta} = -\tfrac{1}{3}\cot^3\theta - 2\cot\theta + \tan\theta.$$

6. Show that $\int_0^a \frac{x^5\,dx}{\sqrt{a^2 - x^2}} = \int_0^{\frac{1}{2}\pi} \sin^5\theta\, d\theta$, and hence write down the value of the integral.

7. Show that $\left[\frac{x^m - 1}{x^n - 1}\right]_1 = \frac{m}{n}$, and $\left[x^{\frac{1}{1-x}}\right]_1 = \frac{1}{e}$.

8. Prove that $e^x \sec x = 1 + x + x^2 + \tfrac{2}{3}x^2 + \ldots$.

9. The moment of inertia of a right circular cone of adius r about its geometrical axis is $m\frac{3}{10}r^2$.

10. Given the curve $y^2 (a - x) = x^3$, or $x = a \sin^2 \theta$ and $y = a \sin^2 \theta \tan \theta$, find :—

(1) The tangent at the vertex.

(2) The asymptote.

Also, show that :

(3) The area between the curve and asymptote $= \frac{3}{4} \pi a^2$.

(4) The volume of this about the asymptote $= \frac{1}{4} \pi^2 a^3$.

11. The maximum value of $\frac{\log x}{x}$ is $\frac{1}{e}$.

12. If $y = a \cos n x + b \sin n x$, then $\frac{d^2 y}{d x^2} + n^2 y = 0$.

THIRD YEAR.

MATHEMATICS II.

SATURDAY, APRIL 14TH :—MORNING, 9 TO 12.

1. A body is held in equilibrium on a rough inclined plane by a force acting up the slope. Find the limits of this force.

2. A train moving at the rate of 40 miles per hour on a level track is brought to rest by friction in half a minute. Show that the coefficient of friction is $\frac{11}{180}$.

3. What is meant by the efficiency of a machine? Find the efficiency of a screw in terms of the pitch angle and the friction angle.

4. A traction engine weighing 5 tons can haul 15 tons on a level, the coefficient of friction being 0.02. Show that it can haul only $8\frac{1}{3}$ tons up a one per cent grade.

5. A train of 100 tons is running at 30 miles per hour up a two per cent. grade. Find the horse power required, the resistance on the level (axle-friction, etc.) being 10 pounds per ton.

6. A body has two component rotations of 7 and 15 radians per second about axes containing an angle of 120°. Show that the resultant rotation is 13 radians per second.

7. A sphere oscillates about a horizontal tangent. Show that the length of the simple equivalent pendulum is $\frac{7}{10}$ of the diameter.

8. Find the kinetic energy of a body rotating about an axis with angular velocity ω, the moment of inertia of the body with regard to the axis being I.

9. A sphere rolls down from the top of another sphere. Show that the contact between the spheres will cease when the line joining the centres makes an angle $\cos^{-1} \frac{10}{17}$ with the vertical.

10. A body strikes a smooth plane at an angle θ with the normal, and rebounds. Show that the angle of reflection is $\tan^{-1}\left(\frac{\tan \theta}{e}\right)$.

FIRST AND SECOND YEAR APPLIED SCIENCE.

EXPERIMENTAL PHYSICS. HEAT, SOUND AND LIGHT.

THURSDAY, APRIL 5TH —MORNING, 9 TO 12.

1. Upon what does the velocity of sound in air depend? Shew that it is not affected by a fall in the barometer. If the velocity at freezing point is 1086 feet per second, find its value for 35° C.

2. Explain in detail how you would find the vibration-number of a tuning-fork by means of a Sonometer.

3. Give a brief general account of the production of (*a*) vowels, (*b*) consonants in human speech.

4. Quote the formula connecting the distances of an object and its image from the lens forming it. Where must a convex lens of focal length 2 inches be placed so as to form (1) a real image at 10 inches from the lens, (2) a virtual image at 10 inches from the lens? Draw a diagram for the latter case, tracing a pencil of rays from a point not on the axis to an eye behind the lens, and find the magnification of the object.

5. Describe carefully the adjustments of a spectrometer. How would you use it to determine the index of refraction of a given prism for the line D? Give the formula.

6. Explain Refraction (1) on the Corpuscular Theory, (2) on the Undulatory Theory. What is the importance of this point in a comparison of the theories

7. How does Plane-polarized Light differ from Common Light? Explain the action of a Nicol's Prism. Describe the Saccharimeter, stating clearly the property of sugar on which it depends.

8. Briefly describe (1) a thermopile, (2) a platinum resistance thermometer.

9. State Charles' Law for the expansion of a gas with temperature. Describe the air thermometer at constant volume, and the method of using it to determine the coefficient of expansion of a gas.

10. Give the Specific and Latent Heats of ice. How much ice at 10° C below zero will be required to cool 25 lbs. of water from 55° C to 18° C?

11. Describe some form of Hygrometer. Explain the terms, Dew-Point, Relative Humidity. The pressure of water vapour is 23.55 mm at 25° and 15.357 mm at 18°. What is the relative humidity at 25°, when the Dew-Point is found to be 18°?

12. What is an Indicator Diagram? Explain how it is used to find the Horse-power of an engine.

13. Compare the theoretically possible efficiency of an engine working between 20° C and minus 180° C with that of one working between 300° F and 110° F.

THIRD YEAR APPLIED SCIENCE.

EXPERIMENTAL PHYSICS, ELECTRICITY AND MAGNETISM.

MONDAY, APRIL 2ND:—MORNING, 9 TO 12.

1. What is meant by a "magnetic line of force"?

Show how the lines of force for a uniformly magnetised bar magnet can be drawn from theory. Sketch the lines of force for a uniformly magnetised bar magnet and also for an ordinary bar magnet. Give the relations between the pole strength, magnetic moment and intensity of magnetization of a magnet.

2. A bar magnet 10 cms. long is placed in the meridian with its *N* pole pointing northwards. A small compass needle is found to be in neutral equilibrium 20 cms. vertically above the centre of the bar. Find the magnetic moment and pole strength of the magnet.

3. Contrast the magnetic properties of soft iron and steel. Define the terms permeability and total induction in iron.

Why cannot a bar magnet be made out of soft iron?

4. State the laws of heating by the electric current.

A 100 volt lamp taking .6 amperes is placed inside a vessel holding a litre of water. Find the time required to raise the temperature of the water through 10°C assuming no loss of heat by radiation, etc.

5. Explain the construction and action of a Daniell's cell.

3 Daniell's cells, *EMF* 1 volt, internal resistance 5 ohms, send a current through 3 and 4 ohms arranged in parallel.

Find the current in the circuit.

(*a*) with cells in series.

(*b*) with cells in parallel.

6. What is meant by Ohm's Law?

Show how to compare the values of two low resistances by the fall of potential method.

If a copper bar 2 metres long, ·3 cms. in diameter, has the same resistance as a bar of iron 150 cms. long and 1 cm. in diameter, compare the specific resistance of iron and copper.

7. State Faraday's Laws of induced currents.

An earth coil is rotated on a horizontal axis which is parallel to the meridian. The number of turns on coil is 100, and the mean area 1000 sq. cms. If the vertical component of the earth's magnetic field is .5 dynes, find the maximum and average *EMF* induced in the circuit when the coil makes 10 revolutions per sec.

8. Explain the construction and action of an induction coil. What is the function of the condenser attached? Why is the shock from a small induction coil diminished by sliding a brass cylinder over the primary?

9. Define unit charge, potential at a point, equipotential surface.

Draw the equipotential surfaces differing by unity round a small sphere charged with 10 units of electricity. Show from first principles that the rate of working in a circuit conveying a current is equal to the product of the current strength and the potential difference of terminals of circuit.

10. Explain the action of a water dropping accumulator. Whence is the energy of the electrification derived?

11. Explain the action of:—

(*a*) duplex method of signalling;

(*b*) receiver of a telephone.

12. Explain the different kinds of windings of a dynamo. Discuss what kind of winding is necessary in order to supply current to a number of arc lights in parallel.

THIRD YEAR.

ELECTRICAL ENGINEERING.

PHYSICAL LABORATORY WORK.

TUESDAY, APRIL 3RD :—MORNING, 9 TO 12.

1. A magnet 6 cms. long is placed in the *end on* position at right angles to the meridian with its middle point 30 cms. distant from the centre of a small magnetic needle suspended in the meridian. The magnetic needle is deflected 15°. Find the ratio of M to H where M is the magnetic moment of deflecting magnet and H the horizontal component of the earth's field. Tang. 15° = .268.

If the above deflecting magnet be suspended horizontally and allowed to oscillate under the influence of H, find the value of H.

given $MH = \pi^2 \ n^2 \ K$

where n = (transits per sec) = ·25

K = (moment of inertia) = 100.

2. Define unit current. From this definition deduce the expression for the strength of the field at the centre of the coil of a tangent galvanometer of r cms. mean radius and n turns of wire for a current of C *CGS* units.

Describe how this instrument can be used to measure an electric current if H be known. Given r = 15, n = 30, θ = 60°, H = .15, find current in *amperes*.

3. Describe a method of finding the mechanical equivalent of heat by an electrical method.

4. Discuss the advantages and disadvantages of the copper voltameter method of measuring electric current. If a copper voltameter had been placed in series with the tangent galvanometer described in IV, question (2), how much copper would have been deposited on the cathode in 30 minutes ?

Electrochemical equivalent of copper = ·000328 grammes.

5. Describe how a D'Arsonval galvanometer can be made to measure volts or current. In a commercial instrument of this type what conditions must be satisfied in order to obtain a scale of equal parts.

If a voltmeter on the above principle read from 0 to 100, how can it be made to read from 0 to 1000. If the scale of an ampere-meter read from 0 to 100, describe two ways of changing its scale to read from 0 to 1000.

6. Describe a simple form of ampere meter to be used to measure alternating currents.

. Describe the Carey-Foster method of comparing two nearly equal resistances. How would you obtain the resistance of the bridge wire per unit of length.

Describe the making, adjusting and marking of a one ohm standard resistance coil.

8. Describe an accurate method of calibrating a voltmeter of the D'Arsonval type. Suppose the range of the instrument to be 2 volts, resistance 200 ohms, give details of apparatus required.

How would you express your results for convenience of reference.

9. Describe a method of measuring temperature by the use of an electrical resistance thermometer. If the thermometer were made of platinum wire having a temperature coefficient of .00380 per 1°C and a resistance of 5.25 ohms at 0°C, what would the necessary resistance per inch of the bridge wire be to give a scale of 100°C to 10″.

How would you find the temperature coefficient of the platinum?

What arrangement might be made so that the platinum thermometer could read from 0 to 100, 20 to 120, 40 to 140, etc.?

10. What is an electrolyte? How can the electrical resistance of an electrolyte be measured? What is the effect of density of the solution and temperature on the specific resistance of a solution of common salt?

Design a salt water rheostat to absorb the output of a 1000 *K.W.* 500 volt generator. Given the specific resistance of the salt solution to be 3.5 ohms at the temperature and density to be used, the distance between electrodes 10 feet.

B.Sc. EXAMINATIONS.

ELECTRICAL ENGINEERING.

PHYSICAL LABORATORY WORK.

TUESDAY, APRIL 3RD:—MORNING, 9 TO 12.

(*Not more than seven questions to be attempted.*)

1. Explain the theory of Gauss' method of determination of the horizontal component of the earth's magnetic field. Describe in detail the oscillation experiment and the corrections to be applied.

2. Describe the method of determining the *E M F* of a Clark cell in absolute measure by means of a current balance, explaining how the constants of the coils are determined.

3. Explain the effect of chemical constitution, mechanical state and temperature on the magnetic properties of iron. Describe a method for the determination of the hysteresis curve for a specimen of soft iron, and explain how to deduce the hysteresis loss.

4. Explain the steps in the calibration of a Siemen's Electrodynamometer of 15 amperes' range. What is the effect of a stray magnetic field on the readings, and how is it corrected for?

5. Describe the construction and action of a Kelvin current balance. Explain how to determine accurately the constant of the balance.

6. Describe the construction and method of use of a low resistance standard. Show how a low resistance may be measured with accuracy.

7. Explain the construction of a Clark cell and the method of determination of its temperature co-efficient.

8. Show how to find

(*a*) insulation resistance per metre of a twin wire.

(*b*) insulation resistance of a condenser.

9. Describe a method of determination of the self inductance of a coil of wire by means of an alternating current. How is the angle of lag of the current determined?

10. Describe the chief points in the charging and discharging of a storage cell. Show how to find the efficiency of a storage battery.

SECOND YEAR.

ELEMENTS OF ARCHITECTURE :—THE ORDERS.

DESIGN.

SATURDAY, APRIL 7 :—9 A.M. TO 1 P.M.

Over a drinking fountain in a public garden is to be erected a small pavilion of the Roman Doric Order, square in plan, presenting in each elevation an open arcade flanked by coupled, engaged columns, the arch itself being carried by smaller Doric columns (as in the well-known "Palladian motive" at the Basilica of Vicenza).

A rough sketch plan (to no scale) is annexed; from centre to centre of inner main columns (as shown) is 9 feet 4 inches; columns are to be 18 inches diameter; the whole will stand on 2 or 3 steps; the roof will be concealed by a balustrade or ornamental blocking-course.

The design should tend rather to slenderness; ordinary proportions may accordingly be slightly dep arted from; the arch may be three-centred, if desired.

Required:—Elevation to half inch scale; plan (one quarter only) to quarter inch scale.

Drawings are expected to be in pencil, but must be accurately and neatly rendered.

SECOND YEAR.

HISTORY OF ARCHITECTURE (*First Paper*).

MONDAY, APRIL 9TH:—MORNING, 9 TO 12.

N.B.—Six questions only to be attempted.

1. What are the special characteristics of Greek architecture, constructional and aesthetic? Add to your answer an architectural account of any one Greek building.

2. What are the principal points of contrast between Greek and Roman architecture? Add *either* (*a*) a description of any typical Roman building, *or* (*b*) a note on the applicability of Greek and Roman architectural features to modern work.

3. Describe Santa Sophia, Constantinople, and compare it with ther domed buildings.

4. Sketch a typical Byzantine capital; also a Norman capital; adding a note upon their derivation, and connection with classical examples.

5. Give a brief account of *any one* branch of Romanesque architecture.

6. What are the special constructive principles exemplified in Gothic architecture?

7. Write a note, descriptive and critical, of any building, architecturally important, not otherwise included in your answers.

SECOND YEAR.

HISTORY AND ELEMENTS OF ARCHITECTURE.

WEDNESDAY, APRIL 11TH :—MORNING, 9 TO 12.

N.B.—Candidates will not answer more than six questions in all; the questions to be omitted are:—either No. 1 or No. 2 (not both), and either No. 4 or No. 5 (not both).

1. Draw a sketch plan of the Parthenon; and compare it with *either* a more ordinary Greek hexastyle temple *or* a typical Egyptian temple.

2. (Alternatively to Question 1.)
Draw a sketch plan of the Erechtheum, discussing its peculiarities.

3. Compare the mouldings of Greek architecture with those of Roman, more especially in the Doric Order.

4. Trace the development of vaulting from Romanesque to late Gothic architecture in England.

5. (Alternatively to Question 4.)
Give an account of the development of window tracery in English Gothic architecture after the "Lancet" period.

6. Draw in longitudinal section one bay of the nave of a typical Gothic cathedral, naming the subdivisions; and draw two sketch sections of the pier-arch mouldings, one early ("Lancet,") and one later ("Decorated"). These sections to be about 3″ across in the drawing.

7. Draw in section a Greek and a Renaissance Attic base; also two sections of Gothic bases derived from the same type. (Sections to be about $2\frac{1}{2}$″ in depth in the drawing.)

8. Write a note on the transference to stone of forms originally belonging to wooden architecture.

THIRD YEAR.

HISTORY OF ARCHITECTURE—THE RENAISSANCE IN ITALY AND SPAIN.

MONDAY, APRIL 2ND :—MORNING, 9 TO 12.

N.B.—Sketches in illustration of answers need not be elaborated, but must be clear; they may be in either pencil or ink.

1. Give an account of the work carried out in the 15th century in

completion of the Duomo at Florence ; estimate the importance historically of this work and of other work of its architect in the evolution o the architecture of the Renaissance.

2. Mention (with brief notes, descriptive and critical) some of the more important works in civil (not ecclesiastical) architecture of any two of the following :—(1) Peruzzi; (2) Michael Angelo; (3) Sanmicheli; (4) Palladio.

3. Discuss the judgment that "Renaissance architecture is a purely imitative revival of the antique,"

Or (*as an alternative*),

Give some account of the conditions leading to the rise of Renaissance architecture in Italy.

4. Sketch in geometrical elevation any two well-known Italian *palazzi*, one Venetian and one Roman, adding in each case brief notes and a critical estimate of the design.

5 Give some account of the specially characteristic features of Renaissance architecture in Spain, with sketches in illustration.

THIRD YEAR.

HISTORY OF ARCHITECTURE—THE RENAISSANCE IN FRANCE AND ENGLAND.

MONDAY, APRIL 2ND :—AFTERNOON, 2 TO 5.

(*N. B.—Five questions only to be attempted; sketches in illustration of answers need not be elaborated and may be in pencil or ink.*)

1. Mention, with brief descriptions, one or two typical examples of the early French Renaissance Château, analyzing the features characteristic of the style, and discussing the extent of Italian influence upon French architecture at this period.

2. Enumerate the chief differences between the architecture of the reign of Louis XIV in France and early French Renaissance, pointing out in what ways the latter work would seem to its designers to be an advance upon the earlier.

3. Trace the course of architectural progress in England from the beginning to the end of the sixteenth century, comparing it briefly with contemporary work in Italy. How far can any of this English work properly be considered "Italian"?

4. Discuss the principal features characteristic of the "Elizabethan Mansion," analyzing their origin and source (so far as may be). In what respects do you consider this architecture to be rightly classed as "Renaissance"?

5. Write a short essay on Sir Christopher Wren's designs for churches other than St. Paul's (London).

6. Give some account of architecture in France and England in the latter part of last century, with notes on the "Colonial" work of America as related to European work.

THIRD AND FOURTH YEARS.

DOMESTIC ARCHITECTURE—DESIGNING.

SATURDAY, APRIL 7TH :—9 A.M. TO 1 P.M.

N.B.—Figures give proportional marks. Drawings to be sketch-plans only to 1-16 scale, such as an architect might "rough out" as preliminary sketches, in pencil and on tracing paper, if preferred.

1. Draw out a plan for the public rooms of a country house in which a modern employment of the *Hall* is to be an important feature. Besides main entrance, hall and staircase, there are to be included :—drawing room, ante-drawing room, dining-room, library or billiard room, and any other rooms desired. The direction of the compass should be indicated. (35)

2. Design the principal floor of a large house, in which the symmetrical arrangements of the so-called "Palladian" type are to be generally (but not slavishly) adhered to. The rooms required will be much as in Question 1 (above), namely, hall, principal staircase, one or more drawing rooms, dining room (with service room and service stair), library ; but to these others may be added, such as billiard room, conservatory, morning room. Kitchen and offices are presumed to be in basement (or separate wing) and need not be included. (50)

3. Sketch out an arrangement of a complete bedroom suite, forming the principal guest-rooms of a large house, comprising boudoir, bedroom, dressing-room, bathroom and w.c. (15)

THIRD YEAR.

ARCHITECTURE.

THURSDAY, APRIL 12TH :—MORNING, 9 TO 11.30.

(N.B.—Any questions may be attempted up to a total of 60 marks. Figures in brackets give values of questions.)

1. Discuss the general architectural considerations that properly influence the design of buildings comprised in (*a*) State architecture; (*b*) Municipal architecture; contrasting both with (*c*) Domestic architecture. (20)

2. Write a note upon the architectural character you would aim at giving to the design of buildings for Schools. (15)

3. Contrast the general conception embodied in the design of a so-called "Palladian" house with the more modern type of irregular domestic architecture. Add a (historical) note upon the introduction of the "Palladian" type into English domestic work. (15)

4. Sketch the ground plan of a typical Pompeian house of some importance, the site being assumed to be rectangular. (10)

5. Discuss the suitability of the "Elizabethan mansion" as a type for modern domestic work. (15)

6. How far do the characteristic features of the Italian Renaissance *palazzo* appear to you to survive as suitable to modern requirements? (10)

7. Write a note upon "aspect" and "prospect" as factors important in designing domestic work. (10)

8. Give some account (historically) of the "hall" in domestic architecture from the 12th to the 14th centuries (inclusive.) (15)

THIRD AND FOURTH YEARS.

ART HISTORY, ANCIENT SCULPTURE.

THURSDAY, APRIL 5TH:—MORNING, 9 TO 12.

N.B. Figures give proportional marks; six questions only to be attempted.

1. Write a short essay upon archaic sculpture as compared with later, fully matured, art, pointing out the merits and defects of each as these appeal to you. Illustrate your answer by reference to such well-known

statues as the Dying Warrior from Aegina and the so-called "Dying Gladiator." (20)

2. Mention some of the more important examples of Egyptian sculpture in the round with which you are acquainted, and discuss briefly the conventions accepted by the Egyptians, and the funerary origin of Egyptian sculpture. (20)

3. Give a brief account of any *four* important Greek sculptors (excluding Pheidias and Scopas) of the 5th and 4th centuries B.C., mentioning such of their works as are known to us. (20)

4. Trace rapidly the progress of Greek sculpture from primitive work up to the culmination in the Athens of Pheidias; adding a note upon the political causes that led to this supreme art-epoch in the 5th century. (20)

5. Describe and criticize the "Venus of Melos," now in the Louvre (Paris), with a note upon the circumstances attending the discovery of the statue and the inscribed base. (15)

6. Give some account of Scopas and such works of his as are known, and trace his influence upon his direct and more remote successors. (15)

7. Describe *briefly* the sculptured decorations of the Parthenon; and more in detail, any particular portion of them that you prefer to select (20)

8. How would you proceed, if called upon to make the award in a competition for an important modern commemorative statue? Upon what considerations would you found your criticisms of the sculpture, and on what principles would you base your judgment? (25)

SECOND AND THIRD YEARS.

BUILDING CONSTRUCTION AND HYGIENE.

TUESDAY, 3RD APRIL:—9 A.M.

N.B.—Second Year Students will answer not more than four questions in Section A, and not more than four questions in Section B, i.e., *eight questions in all.*

TIME ALLOWED, 2½ HOURS:—9 TO 11.30 A.M.

Third Year Students (Architectural) will answer not more than three questions in Section A, and four questions in Section B, together with the whole of Section C.

TIME ALLOWED, 3½ HOURS :—9 A.M. TO 12.30 P.M.

Sketches in illustration are expected to be left rough, but must be clearly drawn either in pencil or ink; drawing instruments may be used, but are not necessary.

Section A.

1. State approximately the bearing power of the ordinary soils in their natural condition; and describe briefly the methods by which this may be artificially increased.

2. According to Rankine's formula, how deep should a foundation pit be excavated for a load of 4 tons per sq. ft., if the angle of repose of the materials is 30 degrees?

3. Describe with sketches the means you would take to determine the character and bearing power of the material upon which a heavy and important structure is to be built.

4. Write a specification for a timber pile foundation where hard driving is likely to be encountered.

5. Describe the construction of a footing of concrete and steel.

Section B.

6. What are the special precautions to be taken in bonding brickwork? How far do the same principles apply to stone work? Describe any two kinds of brick bond, and draw plans of two successive courses in either of them for a wall two bricks thick.

7. To what causes is decay in timber chiefly due? What precautions would you take to obviate such decay in (*a*) flooring beams and (*b*) interior supporting posts?

8. In designing joints in carpentry what rules have to be observed? Sketch a joint suitable for each of the following :—(*a*) a purlin bearing on a principal rafter; (*b*) a rafter bearing (obliquely) on a tie-beam; (*c*) a crossbeam ("trimmer-joist") bearing on a girder ("trimming-joist") for flooring (the two being of the same depth); in each case give reasons for the form of joint adopted.

9. Draw in outline, roughly to scale, the truss of a king post roof (span, 20 ft.; rise, ¼ span), naming the parts and giving sketches illustrating any two of the principal joints.

10. Describe any one system of fire-proof flooring, giving section and (if needed) other sketches in illustration.

11. Draw roughly to scale diagram elevations of two wooden partitions (span, 20 ft.; storey, 12 ft. high):—(*a*) with a wide door in the centre; (*b*) with two narrow doors, one near either end. In both cases the partitions are to be carried without bearing on the floor and are to be designed to support the floor above.

Section C. (*Third Year Architectural Students only.*)

12. In a terrace-house provision has to be made for a lavatory and W.C. on ground floor, and, directly over these, a bath-room and W. C. on the floor above. These are all situated to the back of the house; drainage, however, has to be taken to a sewer running along the front of the terrace.

Describe the drainage arrangements you would specify.

13. What tests would you use during construction and at completion to ascertain if the drains of a house were properly jointed?

14. Under what circumstances may water traps become ineffectual? How do you guard against such failure?

15. Give sections of two types of water-closet, noting the advantages and disadvantages of each.

THIRD YEAR.

GRAPHICAL STATICS.

DECEMBER.

NOTE.—*The stresses need not be tabulated; compression stresses should be marked by thick lines in frame and stress diagram.*

1. Six forces act in directions shown by reference to a rectangle (Fig. 1). Determine the magnitude, direction and line of action of the resultant.

2. Determine the stresses in the bridge truss loaded in the manner shown by Fig. 2.

3. Determine the stresses in the roof truss shown by Fig. 3. The main rafters are equally divided by the members perpendicular thereto.

4. A beam of 30 feet span is loaded in the manner shown by Fig. 4. Draw the Shearing Force and Bending Moment diagrams. Construct a scale for the Bending Moment diagram, and mark upon your figure the value of the Bending Moment at $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ span.

5. Determine the stresses in the roof truss (Fig. 5) under the given normal wind load.

6. A crane, shown by Fig. 6, has a vertical post AB, and is loaded with a weight of 5 tons. If the reaction at A is horizontal, determine the direction and magnitude of the reaction at B and the stresses in the members of the frame.

7. A frame (Fig. 7) is hung from a pin X, and carries a load of 5 tons at the joint Y. Determine the stresses in the frame.

8. Determine the stresses in the Fink truss loaded in the manner shown by Fig. 8.

9. Determine by the method of sections the stresses in the bars of the frame (Fig. 9) cut by the section plane AB.

10. A plate of uniform thickness is cut in the manner shown by Fig 10. Determine its centre of gravity.

THIRD YEAR AND B.Sc. EXAMINATION.

THEORY OF STRUCTURES (*Paper* I.)

WEDNESDAY, APRIL 4TH:—9 A.M.

(*At least five questions must be attempted in Part I. and* 3 *in Part II.*)

PART I.

1. A portable hand crane has the dimensions shown in Fig. 1. Determine the weight of the counterbalance at D, and the nature and amounts of the stresses in all the members. (Disregard tension of chain.)

2. Explain the method of sections as applied to determine the stresses in the members of a loaded frame.

Determine the stresses in the bars AB, CD and AD of the frame shown by Fig. 2.

3. A 42 inch car wheel is found to be out of balance to an amount equivalent to a weight of $\frac{3}{4}$ pounds at a radius of 18 inches. What will be the amount of hammer blow on the rails when the car is running at 50 miles per hour?

4. What is meant by the "resilience" of a bar? A bar, 1-square

inch sectional area and 32 inches long, is subjected to a tensile pull of ten tons. Calculate the work stored up in the bar. (E = 30,000,000 lbs. and inches.)

5. Explain the effect of repeated stresses upon materials of construction, and quote formulae representing the results of experiment.

6. Draw to scale the shearing force and bending moment diagrams in the case of a beam, 12 ft. long, supported at its ends and loaded with two weights of 3 and 5 tons at distances 3 and 7 feet from one end. Also draw the curves of shearing force and bending moment when a further load of 1 ton per foot run covers the bridge.

7. Find the width of belt necessary to transmit 10 H. P. to a pulley 12 inches in diameter, so that the greatest tension may no exceed 40 lbs. per inch of the width when the pulley makes 1,500 revolutions per minute ; the weight of the belt is 2.0 lbs. per sqr. ft. and the co-efficient of friction is 0.25, angle of wrapping 180°.

8. Deduce the formulæ $\frac{p}{y} = \frac{M}{I} = \frac{E}{R}$ for a transversely loaded beam, stating all the assumptions made.

9. Determine the position of the neutral axis and the moment of resistance of the given section for a working stress of 5 tons per square inch.

10. The section of a cast-iron girder, and the maximum safe tensile and compressive stresses being given, explain how to determine its resistance to bending.

The dimensions of the section of a cast-iron girder are shown by Fig. 4. Determine the moment of resistance, the greatest permissible tensile and compressive stresses being $1\frac{1}{2}$ and 3 tons per sq. inch, respectively.

If the girder be 20 ft. long and is supported at the two ends, find the greatest safe load which it will carry when uniformly loaded.

PART II.

11. A bar of steel, $2\frac{1}{2}$ ins. by $\frac{5}{8}$ in. in section, is subjected to a pull of 15 tons. The mean line of the load passes $\frac{1}{4}$ inch from the centre of gravity of the section in the direction of the width of the bar. Find the greatest and least stress on the bar.

12. Prove Gordon's formula for the strength of a column in the form

$$p = \frac{f}{1 + a\frac{l^2}{r^2}}$$

Explain why the constant "a" differs according as the column has rounded or squared ends.

13. Deduce expressions for the twisting moments which can be transmitted by solid and hollow shafts.

The shafting of the turbines at Niagara Falls consists of a steel tube 38 inches in diameter and $\frac{3}{4}$ inches thick. Find what horse power can be transmitted at 250 revolutions per minute when the working stress is limited to 9,000 lbs. per square inch. Also find the diameter of a solid shaft which will be equivalent to the above.

14. At a point within a solid there is on some one plane a thrust of 200 lbs. per square inch and of obliquity 15°, and on another a thrust of 80 lbs. per square inch and of obliquity 30°. Find the principal stresses at that point, the position of the axis of greater principal stress relative to the first plane, and the inclination of the two planes to each other.

15. A circular shaft is subjected to a bending moment of amount M and a twisting moment of amount T. Show that the greatest intensity of stress in the shaft will be the same as if it were subjected to a twisting moment $T_e = M + \sqrt{M^2 + T^2}$

16. The section of a retaining wall is a parallelogram, the upper and lower faces being horizontal and one of the diagonals being vertical. The wall retains water level with the top. If the thickness of the wall is 6 feet, find the height (1) so that the stress may nowhere exceed 12,000 lbs. per square foot, (2) so that $q = \frac{1}{6}$. Weight of masonry = 125 lbs. per cubic ft.

17. Find the deflection at the free end of a cantilever of length l and of rectangular section, loaded with a uniform load of W lbs. per foot run and also with a concentrated load W at the free end.

18. A continuous beam having spans of 100 and 80 feet respectively is loaded on the smaller span only with a load of 1 ton per foot run. Determine the holding down pressure necessary to keep the outer unloaded end upon its support. Also determine the other reactions and the bending moment over the centre pier.

B.Sc. EXAMINATION.

THEORY OF STRUCTURES. (*Paper II.*)

TUESDAY, APRIL 17TH :—9 A.M.

1. Write out a specification for the compression members of a steel bridge. A chord compression member is 80 ft. long and is subjected to a total stress of 500,000 lbs. Design a suitable section.

2. A steel railway trestle, 101 ft. high, is to be designed to resist the wind pressures indicated on the accompanying drawings, Figs. 1 and 2. Determine the character and magnitude of the corresponding stresses in all the members.

Find the uplift at *A*.

3. The upper ends of the verticals of an 8 panel truss (Fig. 3) lie in the arc of a parabola, whose perimeter is 128 ft. With panel dead and live loads of 4 and 6 tons respectively, determine the maximum stresses in all the members. Will counterbraces be required?

Take dead loads marked on Fig. in tons.

4. Fig. 4 is a skeleton diagram for the 440 ft. draw span of a highway bridge, its total dead weight being 750,000 lbs. The diameter of the drum is 22 ft. The exposed area of the floor and truss is 22 sq. ft. per lineal foot of span. Determine the overturning effect of the unbalanced wind pressure of 5 lbs. per square foot on one arm. What is the factor of safety?

The length of the centre panel is 22 ft. and the remainder of the span is divided into 18 equal panels. The depth of the truss at the outer hips is 26 ft.; at the inner hips 46 ft; and at the tower 60 feet. The live and dead loads per lineal foot of span per truss are 600 and 750 lbs. respectively. It is assumed that 5,000 lbs. of the panel dead loads are concentrated at the top chord panel points. The assumed uplift at each end of each truss is 25,000 lbs. Determine (*a*) the dead load stresses, with the span open, in *A*.11; *A*.19; *A*.21; 10.11; 19.22; *M*.23; 11.13; 19.20; 14.15; *E*.7.

(*b*) the live load stresses in *A*.1; *G*.13; *K*.17; *A*.11; *A*.19; 7.9; 10.11; 6.7; 16.18, assuming that one arm only is loaded and that it acts as a simple span on two supports.

(*c*) the stresses in *B*.1; *H*.14; *L*.20; 10.11; *A*.19, due to an assumed uplift at end of span of 25,000 lbs. at end of each truss, each arm acting as a cantilever resisting said uplift.

5. Fig. 5 represents the two main riveted trusses of a 10 panel bridge of 210 ft. span. The depth of the trusses is 28 ft. and the distance c. to c. 17 ft. Take the live and dead loads per lineal foot of span per truss to be 2,000 and 1,000 lbs. respectively; the wind loads on the upper lateral system (Fig. 6) to be 200 lbs. per lineal foot and on the lower lateral system (Fig. 7) to be 500 lbs. when loaded and 250 lbs. when the span is empty. Discuss the tendency to reversal in the chord members of the second panel.

6. Fig. 8 is the skeleton diagram for the main trusses for a bridge of 120 ft. span. The trusses are pivotted at the ends and centre, the depth at the ends being 20 ft. and at the centre 5 ft. Find where a load may be placed between A and B, so that it may not produce any stress in X. Find the maximum stresses in all the members cut by the vertical plane in the second panel from the end, the panel dead and live loads being 2 and 4 tons respectively.

7. Fig. 9 shows the magnitude and direction of the stresses concentrated at a pin connected joint. Figs. 10 and 11 show how these stresses are distributed along the pin in vertical and horizontal planes Find the the resultant maximum B.M. to which the pin is subjected. What should its diameter be with a fibre stress of 13½ tons per sq. in.?

8. A market roof (Fig. 12) of 128 ft span is supported on trusse placed 20 ft. apart, which rest upon brick piers of the dimensions shown. The total weight of the roof per truss is 21,000 lbs. With a wind pressure of 40 lbs. per square foot on one side, determine the stresses in the truss members and also whether the piers are stable the weight of the brickwork being 110 lbs. per cubic foot.

9. A beam is loaded in the manner indicated in the diagram (Fig. 13). Determine, graphically, the bending moment and shearing force curves.

B.Sc. EXAMINATION.

THEORY OF STRUCTURES (*Paper III*).

THURSDAY, APRIL 19TH, A.M.

1. Determine the moment of resistance of a given rail section, the maximum allowable stress being 4 tons per square inch.

2. Prove the Theorem of Three Moments in the form

$$8 M_2 (l_1 + l_2) + 4 M_1 l_1 + 4 M_3 l_2 + W_1 l_1^3 + W_2 l_2^3 = 0$$

where the supports are all on the same level and the leads are continuous over each span.

A continuous girder of two spans 60 ft. and 90 ft. respectively, is loaded with a uniformly distributed load of 2 tons per foot run. Determine the reactions at the piers and the B. M. over the centre support, (*a*) when the ends rest upon the supports; (*b*) when one end is fixed horizontally.

3. Show how to design the section of a brick wall, 25 ft. in height and weighing 110 lbs. per cub. ft., which is to retain earth weighing 100 lbs. per cub. ft., level with the top of the wall. The angle of repose of the earth = 30°. Resistance of brickwork to crushing = 40 tons /□¹. Factor of safety = 8. Pressure of earth below wall not to exceed 1½ tons /□ ft. All other data may be assumed.

4. Show that the intensities of the radial and tangential stresses (q) in a thick cylinder subjected to internal fluid pressure are given by $(p + B)\ r^2 = A = (q - B)\ r^2$ where A and B are constants.

Obtain a formula for proportioning the walls of thick cylinders in terms of the fluid pressure and the maximum allowable stress.

5. Explain what is meant by a linear arch.

6. State the conditions governing the equilibrium of a masonry arch. The arch represented in the Fig. is constructed of masonry weighing 150 lbs. cf. The span is 40 ft., the rise 8 ft., the depth of masonry above the centre 3 ft., the thickness of the abutments 6 ft. The centre of resistance at the middle point of upper key is 1 ft. below the crown surface. Deduce (*a*) the resultant pressure in the vertical joint at the key, (*b*) the resultant pressure in the horizontal joint at the springing, (*c*) the maximum stress in the vertical line coinciding with the side of the abutment.

7. Deduce the conditions of invariability of span in an arch with hinged ends.

If a flat parabolic arched rib, of 60 ft. span and 16½ ft. rise, is loaded at 10 ft. from the centre, measured horizontally, with 650 lbs., draw the linear arch and find the B. M. and shear at the point at which the weight is concentrated.

What weight at the centre of the rib will give the same horizontal thrust!

8. Show how to determine the tension at any point of a cable of uniform section and density, hanging freely from two points of support.

A copper telegraph wire, weighing $\frac{1}{6}$ lb. per lineal yard, is suspended between poles on level ground so that the greatest dip of the wire is 2 ft. The tension on the lowest point of the wire is 100 lbs. Find the distance between the poles.

9. What is meant by an "auxiliary" truss? Draw the B. M. and S. F. curves for an auxiliary truss under a live load of uniform intensity, (*a*) when hinged at the centre, (*b*) when there is no hinge at the centre.

10. A suspension bridge has a dip of 30 ft. and the span is 900 ft. If the co-efficient of expansion is .000007 per 1°F. and if 75000 tons per sq. inch is the coefficient of elasticity, find (*a*) the change in dip corresponding to a fluctuation of 50° from the mean temperature, (*b*) the corresponding flange stress in an auxiliary truss 25 ft. deep.

11. Deduce Euler's Formula for the strength of a column with both ends fixed or free.

THIRD YEAR.

STRENGTH OF MATERIALS (LABORATORY WORK.)

TUESDAY, APRIL 17TH:—9 A.M.

(*All the questions may be attempted.*)

1. Describe the behaviour of a piece of mild steel or wrought iron when subjected to tension up to the breaking point.

Draw a probable stress strain diagram roughly to scale for a bar 10 inches long between the gauge points and one square inch in section.

Also mark upon the diagram the load and extension at both yield point and breaking point.

2. Calculate Young's Modulus (E) from the following data of a test of a wrought iron bar 20 inches long between the measuring points and $\frac{3}{4}$ inch in diameter:

Load (pounds).	Extension (inches).
0	0.0000
1000	0.0019
2000	0.0039
3000	0.0056

11. A stream of water, 2 square inches in sectional area, delivers 1 cub. foot per second against the concave side of a hemispherical cup, which moves with a velocity of 20 feet per second in the direction of the jet.

Find the impulse, the work done, and the efficiency.

12. A cast iron hydraulic main of 4 inches in diameter conveys water of a pressure of 750 lbs. per square inch. Calculate the thickness for a working stress of 1 ton per square inch.

13. State the fundamental principles governing the design of water motors, and describe the action of a Borda turbine.

Find the angle of blade at entry and the efficiency of a 10 H.P. Borda turbine from the following data:—the jet at entrance makes an angle of 60° with the horizontal; the depth of the turbine is 3 ft., the total fall to the point of discharge is 19 feet; the mean diameter of the turbine is 4 feet; the quantity of water passing through the turbine is 4 cubic feet per second; angle of blade at exit 30°.

B.Sc. EXAMINATION.

HYDRAULICS (*Paper II.*).

MONDAY, APRIL 2ND :—9 A.M.

1. A stream of water of $\frac{1}{8}$ sq. ft. sectional area delivers 16 cf/s normally against a flat vane. Find the pressure on the vane.

If the vane moves in the same direction as the impinging jet, with a velocity of 32 f/s, find (*a*) the pressure on the vane, (*b*) the useful work done, (*c*) the efficiency.

How would the results be affected if the vane were inclined at 45° to the jet, and moved in the direction of its normal with a velocity of 24 f/s?

2. A surface of revolution is driven in the direction of its axis with a velocity of 16 f/s by means of a jet of water of 18 sq. ins. sectional area, which moves in the direction of the axis with a velocity of 80 f/s, and impinges upon the convex side of the surface. The tangent at the edge of the surface makes an angle of 30° with the vertical. Find the pressure on the surface and the efficiency.

3. An undershot wheel works in a rectangular channel 4 ft. wide, in which the water on the up-stream side is 2 ft. deep and flows with a velocity of 12 f/s; the water on the down stream side is 3 ft. deep. Find the useful work done and the efficiency.

4. Describe a Poncelet undershot wheel and point out its advantages over one with radial floats.

5. Deduce an expression for the useful work of an outward flow tangential turbine.

Find β and the total loss of head from the following data:—

$\gamma = 30°$; $2r_1 = r_2$; $h = 30$ ft.; $d_1 = d_2$; $u_2 = V_2$; $f_2 = 2f_4 = .125$.

6. Show how to determine the mechanical efficiency of a breast wheel.

7. In a low breast wheel of 20 ft. diameter, the water enters the bucket with a velocity of 16 f/s in a direction making angles of 45° with the horizontal and 15° with the wheel's periphery. The wheel makes 7 revolutions per minute and receives 5 cf/s of water. Find the mechanical effect of the wheel and the position of the sluice, which is placed where the stream lines are parallel.

8. In an overshot wheel, show that

$$r_1 \omega^2 \cos(\theta + \phi) = g \sin \phi$$
$$R \cos(\beta - \gamma_1) = r_1 \cos \gamma_1$$

An overshot wheel of 32 ft. diameter, makes $\frac{10.5}{22}$ revolutions per minute. Find the inclination to the horizontal of the water surface in a bucket at 90° from the summit. If the wheel has 90 buckets and the arms make an angle of $22\frac{1}{2}°$ with the periphery, find the depth of the crown.

9. Write down the principal equations governing the general theory of the reaction turbine and neglecting loss of head due to friction, shock, etc., show how to deduce the conditions of greatest efficiency.

How are these equations modified for turbines of the impulse type?

10. In an inward flow reaction turbine of 4.924 H.B., the radial velocity of flow is constant from inlet to outlet and is 8 f/s. The water, with a velocity of 60 f/s enters at 10° with the wheel's periphery, which has a linear speed of 50 f/s. The diameters of the outlet and inlet surfaces are 1 and 2 ft. respectively. Find the tip angles, the head, the efficiency and the quantity of water passing through the turbine per second.

11. A downward flow turbine of $3\frac{9}{11}$ ft. mean diameter and of the impulse type is supplied with $5\frac{1}{2}$ cub. ft. of water per second under a head of 400 ft. and makes 500 revolutions per minute. The water enters the wheel at an angle of $\sin^{-1}.6$ with the horizontal and the depth of the wheel is 1 ft. The water leaves the turbine with a velocity of 60 f/s. Determine the whirling velocity at outlet, the direction in which the water leaves the turbine, the efficiency and the horse-power.

12. A centrifugal pump has a 36 in. wheel of a uniform breadth of $5\frac{1}{2}$ ins. The wheel makes 225 revolutions per minute and delivers 20 cubic ft. of water per second into a discharge pipe of 20 ins. diameter. The angle (β) of the blades at the outer periphery is 42° 20′. Assuming the velo-

city of discharge to be the same as the mean velocity of flow in the volute and disregarding vane thickness, find (*a*) the peripheral speed, (*b*) the velocity of whirl and radial velocity of flow, (*c*) the gain of head available for useful work on entering the volute, and (*d*) the efficiency.

If there are six 5/8-in. blades, what will be the radial velocity of flow?

13. What is the object of a whirlpool chamber? If a 62 in. whirlpool chamber is added to pump in previous example, find the gain of head available for useful work, (*a*) due to chamber, (*b*) on entering volute.

Also find the efficiency.

B.Sc. EXAMINATION.

HYDRAULIC MACHINERY AND LABORATORY WORK.

SATURDAY, APRIL 14TH:—9 A.M.

(*Note—Civil and mechanical students are to attempt 6 questions in the Hydraulic Machinery Section and 3 questions on Laboratory Work. Mining and electrical students, 8 questions in the Hydraulic Machinery Section.*)

HYDRAULIC MACHINERY.

1. Describe, by aid of a sketch, the construction and action of a differential accumulator.

The upper diameter of the ram of a differential accumulator is 4 ins. and the ram is loaded with a weight of 4 tons. Determine the lower diameter of the ram to give a pressure of 1500 lbs. per square inch and the length of stroke in order that the accumulator may contain energy equivalent to 44,000 foot pounds.

2. Calculate the thickness of a cast iron hydraulic pipe of 6 ins. internal diameter, working under a pressure of 900 lbs. per square inch. The allowable working stress may be taken as 3,000 lbs. per square inch.

3. Design a joint for the pipe of question 2, and note on your drawing any features which you regard as important in the construction.

4. Describe any form of three-cylinder rotary engine with which you are acquainted.

A three-cylinder engine, making 45 revolutions per minute, has a stroke of 9 inches. Each cylinder is 5 ins. in diameter and single acting, and the pressure of water is 700 lbs. per square inch. Calculate the HP. for an efficiency of 65 p.c.

5. Describe, by aid of sketches, one form of hydraulic riveter. Show how the pressure in the acting cylinder varies during the stroke, and account for the loss of energy.

6. Show what conditions are favourable for using a Pelton wheel motor. Describe fully the action of the water upon the vanes.

7. State what conditions a governor for a turbine should satisfy, and describe, by aid of a sketch, a form of governor in which an epi-cyclic train of bevel gearing forms an essential feature.

8. Give a concise account of the development of the present forms of turbines from the simple jet reaction wheel.

9. Design the wheel and shaft of an inward flow turbine of the Thomson type from the following data:

Supply of water,	1200 cubic feet per minute.
Effective head,	30 feet.
Revolutions,	210 per minute.
Efficiency of wheel,	75 per cent.

10. Describe the main features of the Hydraulic Power Station at Glasgow.

HYDRAULIC LABORATORY.

1. Show how you would proceed to determine the coefficient of velocity (c) of a jet issuing from an orifice.

In a test of an $\frac{1}{2}$ in. orifice under a head of 18 ft., the following readings were obtained:

Horizontal distance from orifice (feet),	1′	2′	3′	4′	5′	6′
Vertical distance of centre of jet below centre of orifice (inches),	2.45′	3.02″	3.82″	5.04″	6.51″	8.49″

Calculate three values of (c).

2. Describe, by aid of sketches, how the coefficient of discharge of a weir may be determined, and note any point of importance.

In a test of a weir of breadth 48.02 inches, the following data were obtained.

Discharge = 1205.1 gallons.
Time = 10 mins. 16.8 sec.
Vernier Readings (inches).

Time	I	II	III
0	14′.260″	14′.255″	14′.251″
2	14′.260″	14′.260″	14′.245″
4	14′.300″	14′-260″	14′.232″
6	14′.271″	14′.250″	14′.240″
8	14′.265″	14′.250″	14′.240″
10	14′.271″	14′.255″	14′.242″

Zero readings of verniers.

15.230″ 15.211″ 15.209″

Determine the coefficient of discharge.

3. Describe the centrifugal pump in the hydraulic laboratory, and show, by sketches and a short description, how you would proceed to test its efficiency.

Determine the efficiency of the pump from the following data of a run when the pump was driven direct by a Crocker Wheeler motor developing 13.12 H.P.

Mean height of suction to centre of pump	= 5 ft. $4\frac{3}{4}$ ins.
Lift measured from centre of pump	= 18 ft. $10\frac{1}{4}$ ins.
Quantity of water per second by weir measurement	= 1.89 cub. ft.
Length of piping	= 62 ft.
Diameter of piping	= 8 ins.
Coefficient of friction of water against cast iron	= .0075

4. Describe, by aid of sketches, the arrangement of the wheel and guide blades of the new American turbine in the laboratory, and in particular show the arrangements for varying the supply of water in the guide passages.

Calculate the efficiency of the turbine from the following experimental data. Run at $\frac{3}{4}$ gate.

Load on brake	= 38 lbs.
Total quantity of water	= 4477.5 gallons.
Time by chronograph	= 310.2 seconds.
Mean pressure of water in supply pipe	= 11 lbs. per sq. in.
Diameter of brake wheel.	= 18 inches.
Total revolutions	= 4010

SECOND YEAR.

SURVEYING.

SATURDAY, APRIL 7TH :—MORNING, 9 TO 12.

1. Calculate the bearing and distance omitted in the notes of the following survey :

N 52 E	——
S 29¾ E	410
S 31¾ W	769
——	713

2. Mention all the tests necessary to prove that a surveyor's compass will do accurate work. State whether the compass in the room requires any adjustment. Correct the following notes for local attraction.

Station.	Backsight.	Foresight.
1	S 41.15 E	N 66.15 E
2	S 64 W	S 48.45 E
3	N 45 W	N 79.15 E
4	S 77.30 W	S 4.45 E
5	N 6 W	S 86.30 W
6	N 86.45 E	N 42 30 W

3. Explain clearly the adjustment of a dumpy level, giving a reason for each movement made.

4. Explain the purpose of the object glass, the crosshairs and the eyepiece in the telescope of a surveying instrument. What is parallax? How can it be removed? The lens of a small transit has a principal focal length of 8″. How far would the crosshairs be from the object glass if the picket were 100 ft. away? How far if 10 ft.?

5. Deduce a formula for the Foster Double Image Micrometer. Determine by observation the error of the zero point and the constant of the instrument.

6. A 3° 30′ curve has a central angle of 29° 30′ and commences at sta. 215 + 60 and hubs are taken at 218 + 10 and 220 + 70 and at the E. C. Calculate the notes for running this curve, and plot it just as it would be run in. Scale 50 ft. = 1 in.

7. Construct a sheet of logarithmic cross section paper showing the lines for every unit from 1 to 10. What peculiar property of this paper makes it of great practical use? Is there any limit to the size of the numbers that it can be taken to represent? Give the reason for this.

8. Give the general formula for the polar planimeter, and explain how it can be made to measure areas in differents units. What is the zero circle? What precaution must be taken with regard to the position of the pole when measuring an area? Give the reason for this.

9. State clearly three methods that may be employed to carry a survey line down very steep shafts.

10. Describe briefly the principal features of the system used in laying out the Dominion Lands.

N.B.—Candidates may omit
either 3 or 4
either 7 or 8
either 9 or 10.

Questions 1, 2, 5, 6, will be given twice the number of marks given for the other questions.

THIRD YEAR.

SURVEYING.

TUESDAY, APRIL 10TH:—MORNING, 9 TO 12.

1. Write out the field notes for a 5° degree curve with transition ends, the central angle being 20° 00′, the transit being set up at the beginnings and ends of the transition ends and at 0 + 90 from the beginning of the first transition and at 1 + 00 from the end of the second transition. Calculate the tangents to the curve, and plot it as it would be run in the field to a scale of 50 ft. to the inch.

2. Describe clearly all the operations necessary to determine the discharge of a large river.

3. Describe the apparatus used for deep sea soundings and also that used to determine the direction of deep sea currents.

4. Report on the adjustment of the sextant and determine its index error. Under what circumstances is the three point method of determining the position of an object valueless. How far must the observed points be distant from the given sextant in order that the error in the measurement of the angle arising from their nearness may be inappreciable.

5. State what movements are necessary to put the transit in perfect adjustment. The instrument being designed to measure horizontal and vertical angles correctly, explain why each adjustment you find to be required is necessary in order that the instrument shall fulfil its purpose.

6. The level is out of adjustment. Calculate how much a reading taken with it on a rod 250 ft. distant would be in error.

7. Calculate the length bearing and inclination of the line I-III in the following survey :

I Plumb Bob	301° 13′ — 13° 42′	17.73
Down Plumb Bob		30.11
Plumb Bob II	121° 13′ + 18° 35′	19.52
II—III	269° 29′ + 16° 23′	20.15

Draw a plan and elevation of the points on a scale of 50 ft. to the inch

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THIRD YEAR.

PRACTICAL ASTRONOMY.

MONDAY, APRIL 9TH :—AFTERNOON, 2 TO 5.

1. Calculate the sidereal time in long. 10° E when it is 11.15 A. Standard mean time in Montreal to-day.

2. The sun was observed this morning in Montreal at an altitude of 20°. Calculate the local mean time of observation.

3. Equal altitudes of the sun were observed to-day in Montreal at $8^h\ 50^m\ 20^s$ and $3^h\ 10^m\ 00^s$ local mean time. Calculate the watch error.

4. The *double* altitude of the sun's centre when on the meridian was observed to day to be 100° 00 and the index error 5′ 20″.
Calculate the latitude of the place.

5. (*a*) Bootes (R.A. $14^h\ 11$) was observed to-day at 42° altitude having an eastern azimuth of 110°. Find the latitude of the place of observation.

6. Correct the times of the following meridian transits for level azimuth and collimation, *b* being 0.7s, *a* 0.1s, and *c* 0.2s (L.W.)

Lamp East.		
Declination	9° 32′	65° 50′
Observed time of passage	$16^h\ 53^m\ 37$	$17^h\ 09^m\ 23$
Lamp West.		
Declination	52° 22′	
Observed time of passage	$17^h\ 28^m\ 57$	

B.Sc. EXAMINATION.

ASTRONOMY.

FRIDAY, JANUARY 26TH.

1. Describe briefly two methods of measuring the magnifying power of a small telescope.

2. Show how to put a transit instrument in the prime vertical. Show how to reduce the observations with such an instrument to obtain latitude. Obtain the necessary formulae and corrections.

3. Prove that the mean of two or more equally spaced Verniers gives results free from error of eccentricity. Show how to measure the error of eccentricity and the relative positions of the centre of the circle and the Alidade.

4. Show how to measure the collimation error and also the inclination of the horizontal axis of a transit instrument by nadir (reflection from mercury) observations.

B.Sc. EXAMINATION.

GEODESY.

TUESDAY, APRIL 10TH:—9 A.M.

1. Give a brief outline of the system on which a large triangulation survey is conducted.

2. State what conditions are to be observed and describe precisely the method of procedure in the measurement of a base line with a steel tape and subsequent reductions, in order to obtain the highest accuracy in the result.

3. Give a method of adjusting the measured angles of a quadrilateral deriving all necessary formulae.

4. When the angles of a system have been adjusted, how are the computations for difference of latitude made?

5. What do you understand by the *station* correction to the computed value of a point in latitude and longitude? To what is it due?

6. How is gravity determined by the use of the reversible pendulum?

(*a*) Prove that the centres of suspension and oscillation are interchangeable.

7. Obtain an expression for the area between two meridians and two parallels.

8. If you were in the wilderness and without any knowledge whatever of position or time, state in proper sequence how you would determine your geographical position; your only instrumental equipment being a sextant and a watch.

FIRST YEAR-DESCRIPTIVE GEOMETRY.

FRIDAY, APRIL 6TH :—MORNING, 9 TO 12.

1. Show the plan and elevation of two lines which meet on the V.P 2½ in. above XY, and rest on the H.P. One line is at 45° to H.P. and 25° to V.P.; the other is at 30° to H.P. and 55° to V.P. Rabat these lines on to the H.P. and thus show the angle contained between them.

2. A rectangle 1½ in. by 2¾ in. has one of its longer edges in the V.P. at 45° to XY. The plane of the figure is at 35° to the V.P. Show the plan and elevation of the figure.

3. A, B and C are the angles or corners of an equilateral triangle and are respectively ½ in., ¾ in. and 2 in. above the H.P. The side of the triangle is 2 in. This triangle is the base of a tetrahedron. Show the plan and elevation of the solid.

4. A right circular cone, generator 3½ in., diameter of base 2½ in., is placed so that its apex is in the H.P. Its axis is at 45° to the H P. and 30° to the V.P. Show its plan and elevation. Also show the shape of the section of the cone, while in this position, by a plane parallel to the V.P. and cutting the axis of the cone in a point whose distance from the apex is one third the length of the axis.

5. A square prism 2½ in. diagonal of end, length 3 in., stands vertically on the H P. with one diagonal of end parallel to V.P. A regular pentagonal prism, edge of end 1¼ in., has its axis parallel to V.P. and bisecting that of the square prism, while the nearest rectangular face of the pentagonal prism to the V.P. is parallel to the V.P. Show the plan and elevation of the solids with the interpenetration lines clearly marked. Show also the development of the surface of the pentagonal prism, whose length may be made 3 in.

6. A right circular cylinder of 1½ in. diameter penetrates another cylinder 1¾ in. diameter whose axis is vertical. Their axes are parallel to the V.P., but intersect at an angle of 60°. Find the penetration lines and their development.

SECOND YEAR—DESCRIPTIVE GEOMETRY.

FRIDAY, APRIL 6TH :—MORNING, 9 TO 12.

1. The horizontal and vertical traces of an oblique plane make angles of 40° and 60° respectively with XY; (*a*) find a point in the plane $1\frac{1}{2}$ in. from the H.P. and 1 in. from the V.P. (*b*) draw a line 2 in. long, passing through the point and lying in the oblique plane, and inclined at 30° to the H.P.

2. The plane of a circle of 2 in. diameter is inclined at 70° to the H.P. and 45° to the V.P. The centre of the circle is $1\frac{1}{2}$ in. above the H.P. and 2″ in front of the V.P. Let this circle be the base of a right cone whose axis is 3 in. long. Show the plan and elevation of the solid.

3. One diagonal of an octahedron of 2 in. edge is inclined at 35° to H.P., and an adjacent edge is also inclined at 45° to H.P. Draw its plan, and an elevation on a plane not parallel to any edge of the solid.

4. Draw the plan of a cube $2\frac{1}{2}$ in. edge when its adjacent faces are 70° and 30° respectively with the H.P.

5. A cylindrical shaft $1\frac{1}{2}$ in. diameter stands centrally and vertically on a square pediment $\frac{3}{4}$ in. deep and horizontal edges $2\frac{1}{2}$ in. The axis of the cylinder is 2 in. from the V.P. Show the shadow cast by the solids on the vertical and horizontal planes of projection when the plan of a ray makes 45° to XY, and the elevation of a ray 30° to XY. The cylinder is 4 in. long and the nearest face of the square base is at 25° to the V.P.

6. Find the axometric projection of a right square pyramid, edge of base $1\frac{1}{4}$ in., length of axis $3\frac{1}{2}$ in., when the scales along two of the axes are respectively two-thirds and four-fifths.

PERSPECTIVE AND MAP CONSTRUCTION.

FRIDAY, APRIL 6TH :—MORNING, 9 TO 12.

1. Draw the perspective of a masonry pier whose dimensions are given to you. The pier is standing with its side lines at 60° and 30° to the picture plane and with its nearest corner in the picture plane and 20 ft. to the left. The eye is 60 feet from the picture plane and 60 feet above the ground plane. Use the 60 scale.

2. With the projections of the shadow rays making angles of 30° and 45° with line *xy*, draw the shadow cast by the object in question (1) either in perspective or in orthographic projection.

3. *a* Bootes was observed in Lat. 48° 56″ to have an azimuth of 110° and a corrected altitude of 41° 59″. Determine graphically its declination and its hour angle at the time of observation.

4. Draw carefully an outline of L'Orgna's and of Mercator's projection. Explain how the dimensions are calculated and the principle upon which the calculations are based. State where the projection is most in error and for what work it is best suited.

5. The eye being 3 ins above the ground plane and 6 ins. distant from the picture plane, draw the perspective of a line 3 ins. long inclined at 45° to the horizontal and 30° to the vertical and commencing a point in the picture plane 2 ins. to the right and 1 in. above the ground plane, using the M. P. Method.

THIRD YEAR.

ELECTRICAL ENGINEERING.

DIRECT CURRENT DYNAMO MACHINERY.

MONDAY, APRIL 9TH:—MORNING, 9 TO 12.

(*Not more than eight questions to be attempted.*)

1. Discuss fully the principles of design to secure sparkless commutation.

2. Derive an expression for armature torque in terms of induction, number of conductors and current.

3. How may the requisite number of series turns to produce a desired degree of compounding be pre-determined?

4. In what parts of a dynamo do Foucault losses occur? How may they be minimized? How may Foucault and hysteresis losses be separated experimentally?

5. Compare the electrical efficiency of the same machine as a dynamo and as a motor.

6. What experiments would you make on a dynamo for the purpose of rating it? How would you determine the regulation of a dynamo from its constructive data?

7. Calculate the leakage co-efficient of the machine shown in figure1. Indi ate a satisfactory method for experimentally determining the leakage co-efficient in machines of large size.

8. To dete.mine beforehand whether two compound wound dynamos will operate properly in parallel, what curves from each machine must be obtained, and why ?

9. A shunt wound motor is to be operated on a 125 volt line. With 100 amperes in the armature it develops a torque of 1,200 inch pounds. At what speed will it run when developing this torque ? Armature resistance = .15 ohms.

10. Knowing the radiating surface of an armature and the armature losses, what formula would you use in estimating the rise in temperature ?

FOURTH YEAR.

ELECTRICAL ENGINEERING.

ALTERNATING CURRENTS AND ALTERNATING CURRENT MACHINERY.

THURSDAY, APRIL 19TH :—MORNING, 9 TO 12.

(*Not more than six questions to be attempted.*)

1. In a circuit of inductance L and resistance R, required the current at a time t after the application of an E.M.F., E. At the same time what is the energy stored in joules if E = 10.0, L = 0.1 and R = 1.0 ?

2. Given three inductive resistances in series ; for the first resistance R_1 = 0.1 ohms, L_1 = 0.002 henrys ; for the second resistance R_2 = 0.2 ohms, L_2 = 0.001 henrys ; for the third resistance R_3 = 0.4 ohms and L_3 = 0.004 henrys ; also the frequency of the applied harmonic E.M.F. = 60 :—to maintain a current of 20 amperes (mean effective) through the three coils in series, what E.M.F. must be applied, and what is the power absorbed in the whole circuit and in each coil ?

3. Derive the equation for current flow in a circuit possessing resistance, inductance and capacity, in series when an harmonic E.M.F. is applied.

4. Derive the fundamental equation of an alternator and discuss the relative merits of distributed and concentrated winding. What relation does wave form bear to the successful parallel operation of alternators? The proper operation of induction motors?

5. Construct a polar diagram showing the phase relation of E.M.Fs. currents, and induction in an ordinary transformer. Outline the design of a transformer without magnetic leakage.

6. Derive the power equations for two alternators operating, one as a generator and one as a motor, involving the E.M.Fs. of each, the phase differences of the E.M.Fs, their resistances and reactances and the angle of lag or lead between the current and the resultant E.M.F.

7. Find the D.C. and A.C. E.M.F. and current relations in two and three phase synchronous converter.

8. The voltage at the receiving end of a three phase 33.3 cycle transmission line of 14 miles shall be 5,500 volts between lines. The lines consist of three wires No. 0 (B. & S.) (d 82 cm.) 45 cm. apart, of specific resistance $\rho = 1.8 \times 10^{-6}$. What is the resistance, reactance and impedance per line and the voltage consumed thereby at 44 amperes flowing over the line? What is the generator voltage between lines at 44 amperes flowing into a non-inductive circuit?

FOURTH YEAR.

ELECTRICAL ENGINEERING.

ELECTRIC RAILWAYS.

MONDAY, APRIL 9TH:—MORNING, 9 TO 12.

1. A street railway system is sectioned for 30 cars per section. Each car takes an average maximum current of 30 amperes. Station pressure, 550 volts. The centre of a particular section is 10,000 feet from power house. What must be the total section of copper in feeders for a maximum average loss of 10 p.c.

If the load factor of this section is .6, what is the K.W. loss per day in the feeders?

2. Discuss the design of a street railway switchboard.

3. Discuss fully the use of storage batteries in street railway systems.

4. Discuss the several approved methods of bettering the return circuit. What troubles occur through imperfect returns?

5. What conditions should control in the use of substations in distant sections of a street railway system? Discuss the machines and appliances that would be required for same.

6. A car weighing 20 tons is driven by two motors, each capable of exerting a torque of 2750 inch pounds, with 50 amperes in their armatures. Given the co efficient of traction = 20 pounds; grade level, and assuming that the current is maintained at 50 amperes in each motor, required the time to reach a speed of 8 miles per hour.

7. A train weighing 30 tons is drawn by an electric locomotive weighing 20 tons. At a speed of 30 miles per hour, brakes are applied on two pairs of drivers; diameters of drivers 60 inches. What brake shoe pressure must be applied to bring the car to rest in 500 feet.

8. Predetermine the size of the motors required to drive an ordinary single truck car weighing 10 tons up a 6 p.c. grade at 8 miles per hour, co-efficient of traction being 20 pounds per ton.

B. Sc. EXAMINATIONS.

MECHANICAL ENGINEERING LABORATORY WORK.

THURSDAY, APRIL 5TH:—MORNING, 9 TO 12.

(Figures give proportional marks. Seven questions may be attempted).

1. Describe the methods adopted in conducting the trial of either (*a*) a hot air engine, or (*b*) a gas engine. Draw up a trial sheet giving the various observations to be made and results obtained. (No numerical values need be inserted.) (20)

2. In a certain test of an oil-engine 0.694 lb. of kerosene (thermal value 21,490 B.T.U. per lb.) was used per I. H. P. per hour, and 0.842 lb. was consumed per B. H. P. per hour. What was the thermal efficiency, and what was the mechanical efficiency of the engine? (15)

3. In working out results of a steam engine trial, suppose that the mean effective pressure as shown by the indicator is correct within $\pm$ 2 %, the error in weighing the feed may be as much as $\pm$ 0.5 %, and the error in reading the counter may be $\pm$ 1 revolution in 5000. What is the greatest possible error in estimating the feed water per I.H.P. per hour? The error in keeping the time is supposed to be negligible. (20)

4. A quadruple expansion engine on trial indicated 712 H.P. and used 8850 lbs. of steam per hour. The steam pipe pressure was 214 lbs. per square inch absolute, and the feed water temperature 311° F. The steam used was 98% dry.

Find the B.T.U. expended per I.H.P. per minute, and the lbs. of dry steam per I.H.P. per hour. Which of these two numbers gives the better indication of the excellence or otherwise of the performance of an engine, and why?

h at 311° F = 280.6
h " 214 lbs. = 360.6
L " " = 839.5 (20)

5. An engine uses 2000 lbs. of steam per hour, which all passes through a large separator. A throttling calorimeter is fitted between the separator and the engine. Find the dryness of the steam supplied by the boiler, having given:—

Drip from separator	17 lbs. per hour
Pressure in steam pipe (abs.)	110.7 lbs. per sq. inch
" in calorimeter (abs.)	23.7 " " "
Temperature "	268° F.
L at 110.7 lbs.	878.4
H " " "	1184.1
H " 23.7 "	1154-2
Temperature " " "	237° F.

Explain clearly how you obtain any formulae you employ. (25)

6. The following are data of a test of a small duplex feed pump.

Nett area of each steam cylinder	15.56 sq. in
" " " pump "	6.72 "
Mean length of stroke	3.95 ins.
Duration of trial	40 min.
No. of single strokes made by each piston	3978
Mean effective pressure (steam)	51.8 lbs. per sq. in.
" " " (water)	109.5 " " "
Total water pumped	4205 lbs.
Weight per cubic foot of this	61.38 "
Mean gauge pressure in discharge pipe	129 lbs. per sq. in
Height of gauge above surface of water in supply tank	5 feet

Find (1) I.H.P. of the two steam cylinders.
(2) " " water "
(3) Effective H.P. of pump.
(4) Volumetric efficiency of pump.
(5) Mechanical " " (25)

7. Give an account of the tests you would employ in examining a sample of ordinary lubricating oil. If this oil were intended for use in the cylinder of a gas engine, what changes would you make in the methods of testing? (20)

8. Give some account of the various methods of determining the amount of air used by the furnace in a boiler trial, and indicate the sources of error to which they are respectively liable. Why is it important to measure the air? (20)

9. Trials made on the same boiler under similar conditions, but with two different qualities of coal, gave the following results :—

Kind of Coal.	A.	B.	
Feed water per hour	2832	2818	lbs.
Coal fired per hour	324	387	lbs.
Steam pressure	117	120	lbs. per sq. in. abs
Temp. of feed	141	116	deg. Fah.

(Steam dry in each case.)

Coal *B* cost 20 per cent. more than the coal *A*. Which is the more economical, and by how much?

H at 117 lbs. abs. = 1185.4
H " 120 " " = 1186.0
h " 141° F = 109.2
h " 116° F = 84.0 (25)

SECOND YEAR.

MECHANICAL DRAWING.

MONDAY, APRIL 16TH :—MORNING, 9 TO 1.

Make full size drawings of the views of :

(1) A stuffing-box,

(2) A shaft coupling,

as shown on the print supplied.

Finish No. 1 first. Supply any omissions you notice, and correct mistakes. The drawings are to be inked in, and must be correctly to scale, but dimensions need not be figured.

THIRD YEAR.

MECHANICAL DRAWING.

MONDAY, APRIL 16TH:—MORNING, 9 TO 1.

The accompanying sketch shows the cylinders, valve, etc., of the fan engine in the boiler room. No. 1 is a longitudinal section through the centres of the two cylinders and valve. No. 2 is a cross section taken on the line BB. The sketch is not drawn to scale.

The left-hand cylinder (up to the line AA) is to be drawn to scale, one half full size. Do not draw the second cylinder shown on the right hande side of the line AA. Details omitted or left incomplete in the sketch ar to be supplied or finished as follows:

Draw lock-nuts to secure valve on valve-rod.

Show a complete stuffing box, with cover and gland, for the valve-rod. The gland is screwed down by the cover, like the piston-rod gland of the Robb engine.

Complete the piston-rod stuffing box. The gland for this is to be held down by two studs, $\frac{1}{2}$ inch dia., and $2\frac{1}{2}$ inches between centres. Studs are to have lock-nuts.

Draw the nut which secures the piston to the piston-rod, and leave a recess in the cylinder head large enough to receive this nut. The clearance is $\frac{1}{8}$ inch at each end of the cylinder. Show the piston at the bottom of its stroke.

(1) Finish the views Nos. 1 and 2 in pencil, omitting all lines shown dotted on the sketches, and leaving out the right hand cylinder.

(2) Put in proper sectioning in No. 2. Do not dimension either view.

(3 Ink in your drawing.

THIRD YEAR.

MACHINE DESIGN.

FRIDAY, APRIL 6TH:—MORNING, 9 TO 12.

(*Not more than eight questions may be attempted. Figures give proportional marks. Illustrate your answers by sketches where necessary.*)

1. A piano-wire 4 feet long and 0.04 inch in diameter is subject to a pull of 50 pounds. Find the increase in length. E = 29 millions (lbs. and inches.) (20)

2. Explain carefully a method of finding the moment of resistance to bending for a beam of section similar to that of a steel rail, and prove any graphical construction you employ. (30)

3. The load on the horizontal girder of a travelling crane is applied by a carriage having two pairs of wheels, each bearing half the load. Calculate the distance of the centre of the carriage from the centre of span of the girder when the bending moment on the beam is a maximum. (25)

4. Show that for an engine which exerts a maximum turning moment equal to 1.5 times the mean turning moment, the diameter of the shaft (neglecting the effect of bending) is

$$4\sqrt[3]{\frac{\text{I. H. P.}}{\text{Revs. per min.}}}$$

when the maximum shearing stress is about 9,000 lbs. per square inch. (20)

5. A shaft 2 inches diameter is subject to a turning moment of 15,000 lbs.-inches. Find what its diameter ought to be if it is also subject to a bending moment of 15,000 lbs.-inches, the maximum stress remaining the same. (20)

6. The flat ends of a boiler are stayed together by a number of horizontal stays 20 feet long and 2 inches diameter, equally spaced 15 inches apart. The working pressure is 120 lbs. per square inch. Find the maximum stress in the stays due to combined tension and bending, if the material of the stays weighs 0.29 pounds per cubic inch. (20)

7. A wrought iron bolt carrying 40,000 lbs. is cottered into a casting by means of a steel cotter whose thickness is one quarter its depth. Calculate the dimensions of the stay and the cotter, and make a hand sketch of the arrangement, showing the sizes of the parts. The allowable working stress in tension is 10,000 and 13,000, in shear 8,000 and 10,000 lbs. per square inch for wrought iron and steel respectively. (30)

8. Design and sketch a double riveted lap joint for a boiler barrel 4 feet 6 inches in diameter, suitable for 150 lbs. per square inch working pressure. Take efficiency of joint as 0.66 for a first approximation, and allow a tensile stress of 12,000 lbs. per square inch. The ratio of shearing stress to tensile stress may be taken at 0.8. (30)

9. What considerations govern the size of a journal running in a bearing under a given load? A tandem compound engine having cylinders 13″ and 18″ diameter has a maximum effective pressure of 75 lbs. per square inch on the small piston and 35 lbs. per square inch on the large piston. Find the length of the crank-pin (5 inches diameter), and of the connecting rod gudgeon (3 inches diameter), if the allowable working pressures are 800 and 1,200 lbs per square inch of projected area respectively. (30)

B. Sc. EXAMINATIONS.

MACHINE DESIGN I.

WEDNESDAY, APRIL 4TH:—MORNING, 9 TO 1.

Instructions.

All necessary calculations are to be made in full on the foolscap paper provided, and must be handed in with the drawings, which are to be in pencil and fully dimensioned. Mathematical tables, slide rules, note books and books of reference may be used. Ten per cent. marks will be given for neatness and accuracy of drawing.

Design a surface condenser for a set of engines indicating 2500 H P. from the following data:—

Cooling surface	3,000 sq. ft.
Length between tube plates	12 ft.
External diameter of tubes	$\frac{7}{8}$ in.
Thickness of tubes	18 I. W.G.
Pitch of tubes	$1\frac{5}{16}$ in.
Thickness of tube plate (rolled brass)	1 in.

The condenser body is cylindrical, and is arranged generally as shown by sketch supplied. It is to be tested to 30 lbs. per sq. in. by internal water pressure when complete. Tube plates are to be secured to the condenser body by collared bolts so that the waterway can be removed without disturbing the tube plate joint.

The water is to go twice through the condenser.

Calculations.

Find (1) Area of water inlet. (Allow 350 ft. per min. as speed of water in pipe. Exhaust press. 5 lbs. abs. Hotwell temp. 110° F Condensing water, cold 70° F., hot 100° F. Allow 16 lbs. steam per. I. H. P. per hr.)

(2) The number of tubes.

(3) The area of tube plates. (Allow 4 sq. ft. additional for steam space, baffle plate and stays.)

Drawings.

Draw a longitudinal section and an end view showing cover plate, tube plate and tube ends. Scale, one and one-half inches to the foot.

Full size detail drawings are to be made showing the tube ends and glands, and the manner of jointing the waterway to the tube plate, and the tube plate to the condenser. The method of jointing the cover to the waterway is also to be shown.

B.Sc. EXAMINATIONS.

MACHINE DESIGN (II.)

FRIDAY, APRIL 6TH :— MORNING, 9 TO 12.

(*Figures give proportional marks. Seven questions may be attempted.*)

1. Sketch and dimension a double riveted double butt strap joint for a boiler 8 feet diameter, working pressure 125 lbs. Efficiency of joint may be taken at 70% for a first approximation, and a stress of 12,000 lbs. per sq. inch in tension, and 10,000 lbs. in shear may be allowed. (20)

2. Find the diameter of the axle of an electric car, total weight 35,000 lbs., resting on two pairs of wheels. The car has two motors, and the torque on the two axles has to be sufficient to give an acceleration of 3 miles per hour per second. The car wheels are 30 inches diameter, the axle-boxes are 6 ft. 2 ins. centre to centre, and the wheels are 4 ft. 10 ins. centre to centre. Allow a working stress in shear of 9,000 lbs. per square inch on axle. (25)

3. For the same car, find the pitch of teeth in the motor gearing. The spur wheel on the axle (22 inches diameter of pitch circle, and 5 inches width of face) is of cast steel. The allowable stress is 12,000 lbs. per square inch. (Take load as distributed along tip of one tooth. Length of tooth $= 0.7 \times$ pitch.) (20)

4. Explain clearly how to find the shape of the teeth of a worm-wheel gearing with a given worm; show why the profile of the worm-wheel tooth is different at different distances from the central plane of the wheel. (20)

5. Sketch two methods of connecting the segments of a built flywheel, and discuss briefly the considerations governing the design of such wheels. (20)

6. Investigate an expression for the bending moment in a connecting rod due to its own inertia. Find the diameter of a rod (supposed uniform section) for an engine 24″ stroke, 300 revolutions per minute, 4 ft. 4 ins. length of connecting rod, if the stress due to bending is not to exceed 2500 lbs. per square inch. Weight of material of rod is 0.3 lb. per cubic inch. (25)

7. Obtain equations for the thickness of a thin conical piston or cover, subjected to uniform pressure on one side. State clearly what assumptions you make. (25)

8. What are the advantages of mechanically closed valves of the Riedler type? Sketch such a valve either for a pump or for an air compressor. (20)

9. Explain how to determine the cylinder diameters and stroke in a com-

pound engine of given power and piston speed, the initial pressure, cut off in H. P. cylinder, and total rate of expansion being known. (25)

10. An automatic cut-off high-speed engine has a plain slide valve, and the governor alters the cut off by changing both the angular advance and the valve travel. The latest cut off occurs with an angular advance of 30° and a valve travel of 4″. The lead is ¼ inch. Draw (full size) a Zeuner valve diagram and mark on it the lap, and the crank position at cut off. Then find the valve travel and angular advance, if the governor moves so that cut off occurs at a crank angle of 45°; the lead and the lap being as before. (30)

B.Sc. AND THIRD YEAR.

THERMODYNAMICS.

FRIDAY, APRIL 20TH:—MORNING, 9 TO 12.

Only 10 questions to be attempted; 3rd Year students must include question 12. The figures after each question show the proportionate marks awarded.

1. Sketch and describe Newcomen's engine. (10)

2. An engine uses 2 lbs. coal per *I.H.P.* per hr., what is its duty? (10)

3. What is meant by the mechanical equivalent of heat? Give a short description of any way of determining this equivalent. (10)

4. Describe the Crosby indicator, and explain how you would proceed to take an indicator diagram. (15)

5. Explain fully how to obtain the *I.H.P.* of an engine from the indicator diagrams. (10)

6. State Boyle's law and Charles's law.
Find the value of c for air in the equation

$$P\,V = c\,\tau \qquad (10)$$

7. Find the relation between the specific heat of air at constant volume, and the specific heat of air at constant pressure. (15)

8. What is meant by isothermal expansion, adiabatic expansion, dry saturated steam, superheated steam, wet steam? (10)

9. Find the ratio of the final to the initial temperature when air is compressed adiabatically from a pressure P_1 to a pressure P_2. (10)

10. One pound of dry air, temp. 60° F, is compressed adiabatically to one-half its original volume. Find the final temperature and the work done? (15)

11. A steam engine which is reversible except in regard to adiabatic compression, receives steam dry at 205 lbs. abs. and expands adiabatically ($PV^{1.1.5} = k$) down to 10 lbs. abs. It exhausts at 10 lbs. abs and the temperature of the feed is 193.2° F. Find the work done per pound of steam, the efficiency, and the steam used per *I.H.P.* per hour

Vol. 1 lb. steam at 205 lbs. press.....2 241 cub. ft.
H at 205 lbs. press.....1199 *B.T.U.*
h at 205 lbs. press.....356.8 *B.T.U.*
H at 10 lbs. press.....1140.9 *B.T.U.*
h at 10 lbs. press.....161.9 *B.T.U.*
(20)

12. Answer any two of the following :

(*a*) Describe an experiment to determine the latent heat of steam.

(*b*) How would you proceed to determine the mechanical efficiency of a steam engine?

(*c*) Describe an experiment showing the relation between the pressure and volume of a given weight of air.
(15)

13. A steam engine takes steam during the whole stroke. The initial pressure is 100 lbs. abs., the exhaust pressure is 10 lbs. abs. Find the work done per lb. steam, the *B.T.U.* per *I.H.P.* per min., the efficiency and the steam used per *I.H.P.* per hour.

Vol. 1 lb. steam at 100 lbs. press.....4.403 cub. ft.
Vol. 1 lb. steam at 10 lbs. press.....38.16 cub. ft.
H at 100 lbs. press.....1181.9 *B.T.U.*
h at 100 " " .....297.9 *B.T.U.*
H at 10 " " .....1140.9 *B.T.U.*
h at 10 " " .....161.9 *B.T.U.*
(20)

B.Sc. EXAMINATIONS.

THERMODYNAMICS.

THURSDAY, APRIL 12TH :—MORNING, 9 TO 12.

(*Any eight questions. Honours candidates must include Nos.* 10 *and* 11. *Numbers give proportional marks.*)

1. One pound of gas expands from a state (p_1 v_1) to a state (p_2 v_2). Find the external work done, and the change of internal energy, if expansion takes place in such a way that $p\,v^n$ = constant. What are the values for these two quantities if $n = 1$? (20)

2. State the three conditions of reversibility in a heat engine. Explain how far these could be fulfilled in an ideal steam engine. (20)

3. Find the horse-power necessary to compress and deliver ten pounds of air per minute at a pressure of 7 atmospheres absolute, the air being drawn from the atmosphere at temperature 60°F. and forced into a reservoir at constant pressure. The process of compression is adiabatic.

(1 cu. ft. air at 60° and 1 atmo. = 0·0761 lb.) (20)

4. The available heat of a pound of coal is 10,000 *B.T.U.*; find the consumption of coal per *I.H.P.* per hour in a perfect heat engine working between the limits 2500° and 500° Fah. (15)

5. A reversed air engine works with the following cycle :—

(1) Isothermal expansion at 0° F.
(2) Rise of temperature at constant volume.
(3) Isothermal compression at 100° F.
(4) Fall of temperature at constant volume.

The engine is provided with a regenerator. The ratio of the greatest to the least volume is 3 : 1.

Find (*a*) the heat rejected to the hot body per lb. of air per cycle
(*b*) the heat stored and restored by the regenerator.
(*c*) the heat taken from the cold body.
(*d*) the coefficient of performance, having given that

$$\left.\begin{aligned} pv &= 53{\cdot}18\ T \\ \text{and } k_v &= 131{\cdot}6 \text{ ft. lbs.} \end{aligned}\right\} \quad \text{(for air.)}$$

(Note.—Hyp. log. = 2.3026 × common log.)

Could this refrigerating machine be worked without a regenerator? State your reasons. (30)

6. Find the change of entropy if a pound of water is

(*a*) heated from τ_1 to τ_2.

(*b*) completely evaporated at τ_2.

(*c*) superheated to τ_3.

Draw a temperature-entropy diagram illustrating these changes. The diagram need not be to scale. (25)

7. Obtain the adiabatic equation

$$\frac{q_2\ L_2}{\tau_2} = \frac{q_1\ L_1}{\tau_1} + \log_e \frac{\tau_1}{\tau_2}$$

A pound of water at 381·7 deg. F. and 200 lbs. per square inch abs. is allowed to expand adiabatically to a pressure of 20 lbs. per square inch abs. How much will be evaporated?

Pressure.	L	Temperature.
200	843·8	381·7 deg. F
20	954·6	227·9 "

(25

8. One pound of steam of dryness x and latent heat L' is condensed at t' and re-evaporated completely at a lower temperature t'' in the cylinder of a steam engine. How much heat is abstracted from the cylinder walls?

$$(L = 1114 - 0{\cdot}7t) \qquad (20)$$

9. Explain how to find an approximate expression for the velocity of a gas issuing from an orifice under a small difference of pressure. Why cannot the flow under a considerable difference of pressure be treated in the same manner? (25)

10. Having given the $p\ v$ diagram of a quantity of gas, show how to find the rate at which it is receiving or losing heat.

During compression in a certain gas-engine the following numbers were obtained for one pound of the charge, the time elapsing being 0·05 second.

v	p
14 cu. ft.	29·7 lbs. per square inch abs.
10 "	45·2 " " "

Find the rate average at which heat was being lost per second.

$$(\gamma = 1{\cdot}385) \qquad (35)$$

11. The temperature gradient in a cylinder wall being known, show that at any depth x

$$\frac{d\,V}{d\,t} = \frac{k}{c} \cdot \frac{d^2\,V}{dx^2}$$

where V = temperature of metal
k = coefficient of conductivity
c = thermal capacity

What is the solution of this equation when there is a simple harmonic variation of temperature at the surface? (35)

THIRD YEAR.

DYNAMICS OF MACHINERY.

TUESDAY, APRIL 10TH :—MORNING, 9 TO 12.

1. In a direct acting steam engine find (1) an expression connecting the force acting on the piston with that acting along the connecting rod, (2) an expression connecting the force acting on the piston with that tending to turn the crank. Consider the reciprocating parts as massless.

2. A horizontal steam engine has a cylinder $10\frac{1}{2}$ in. diameter, stroke 12 in., connecting rod 3 ft. 6 in. long. Uniform steam pressure 125 lbs. per sq. in. abs.

Find (1) the twisting moment on the crank shaft when the crank is vertical

Find (2) for what position of the crank the twisting moment is a maximum and find its value.

3. Given the indicator diagrams of a single cylinder, direct acting, horizontal engine, the diameter of the cylinder, stroke, length of the connecting rod and mass of the reciprocating parts, explain fully how you would draw a curve of crank effort.

What is meant by the term coefficient of fluctuation of energy?

4. What considerations decide the weight and diameter of a flywheel?

5. Find an expression for the efficiency of a system of two moveable inclined planes.

6. The taper of a cotter is 1 in 7; what must be the coefficient of friction so that it will just slack back?

7. Investigate the forces acting on any form of band brake, and find, in terms of the force on the handle, the H.P. it will absorb.

8. In an oscillating engine the distance between the centres of the crank shaft and trunnions is 18 in., the stroke is 10 in., cylinder diameter 5 in team pressure 100 lbs. per sqr. in. abs.

Find the crank effort when the crank has turned through 90°.

Find an expression showing the relation between the angular velocities of the swinging cylinder and crank pin.

9. Mention the deductions that may be drawn from Galton's experiments on friction.

10. Find the pitch of screw of maximum efficiency.

B.Sc. EXAMINATION.

DYNAMICS OF MACHINERY.

TUESDAY, APRIL 10TH:—MORNING, 9 TO 12.

Only ten questions to be attempted.

1. Obtain an expression for the alternating forces at the ends of the stroke of a direct acting single cylinder engine.

How would you balance these forces?

2. From two to three horse-power are transmitted by a belt. An accurate determination of the power transmitted is desired. Describe any form of dynamometer you would use for this purpose.

Point out the frictional and other losses in the dynamometer.

3. A rocking lever in the valve motion of a Corliss engine has its fixed bearing at its bottom end and is actuated at its middle point by a long eccentric rod of half travel 9″, making 75 turns per min. The lever is kinematically equivalent to a uniform cast iron bar 4 ft. long, 12 in. wide and 3 in. thick. Find the force in the journal due to the inertia of the lever at either end of its travel.

4. A dynamo is bolted to the deck of a ship with the shaft athwart ship. The armature is equivalent to a disc of cast iron 1 ft. in diameter and 2 ft. wide. It rotates at 1500 r.p.m., the top going forwards. If the ship is rolling uniformly to starboard with an angular vel. of 15° per sec., find the magnitude and direction of the forces exerted by the armature in its bearings due to gyrostatic action. Bearings are 4 ft. apart centre to centre, 1 cu. ft. cast iron weighs 480 lbs.

5. A uniform door 8 ft. high and 4 ft. wide, weighing 100 lbs., swings on its hinges, the outer edge moving at the rate of 8 ft. per second.

Find (1) The kinetic energy of the door.

(2) The pressure in lbs., which, when applied at the outside edge at right angles to the plane of the door, would bring it to rest in one second.

6. Given the indicator diagrams of a single cylinder, direct acting, horizontal engine, the diameter of the cylinder, the stroke, the length of the connecting rod and the mass of the reciprocating parts, explain fully how you would draw a curve of crank effort.

What is meant by the term coefficient of fluctuation of energy?

7. What considerations decide the weight and diameter of a fly-wheel?

8. Deduce the equation of equilibrium for a centrifugal governor having a sleeve joined to the governor ball arms by links. Neglect the weights of the rods.

9. What is meant by the coefficient of insensibility of a governor

Show how the weight of the sleeve affects this coefficient.

10. How would you find graphically the forces acting on a Marshall's valve gear?

11. Explain the conditions for the continuity of the suction column in a suction pump without a vacuum vessel, mud strainer or foot valves.

12. Find expressions for journal friction on three hypotheses of distribution of pressure, and compare the frictional losses.

SECOND YEAR.

KINEMATICS OF MACHINES.

MONDAY, APRIL 2ND :—MORNING, 9 TO 12.

(Not more than ten questions may be attempted. Figures give proportional marks. Illustrate your answer by sketches where necessary.)

1. Explain the meaning of the term Machine. What is meant by Constrained Motion? Give some examples of the ways in which constraint is produced in the motion of the parts of actual machines. (15)

2. Show that if three bodies have plane motion, their three virtual axes at any instant lie in one plane. (20)

3. In measuring the angular velocity of the flywheel of an engine at different points of its revolution, the following numbers were obtained :—

Crank angle	0	30	60	90	120	150	180	degrees.
Angular velocity	400	480	520	505	475	430	400	degrees per second.

Make a velocity diagram showing these results, and from it draw a diagram of angular acceleration. Mark on your diagram the maximum value of the acceleration in degrees per second. (Take a horizontal scale of one inch = 30 deg., and a vertical scale of one inch = 200 deg per sec.) (30)

4. Show that the polar diagram of displacement for a particle having simple harmonic motion consists of a pair of circles, touching at the pole. (20)

5. Show how to determine graphically the relative angular velocity of the crank and the lever in the lever-crank chain. Hence show how to draw the angular velocity diagram for the beam of a beam-engine. (20)

6. Sketch the mechanism known as Rapson's Slide. Enumerate the pairs of elements it contains, and mark on your sketch the position of its various virtual centres. (20)

7. Sketch a form of quick-return motion derived from the slider-crank chain, and mark on the sketch the relative lengths of the links which will give a return stroke in $\frac{1}{2}$ the time of the cutting stroke, supposing the crank to rotate uniformly. (20)

8. Distinguish between a dead point and a change point in a mechanism. Give examples of each. (15)

9. Describe the Peaucellier straight line motion, and prove that its tracing point describes a straight line. (25)

10. Prove that if a pair of wheel teeth work together with uniform velocity-ratio, then in any position the common normal at the point of contact must pass through the pitch point. (25)

11. The leading screw of a lathe has 3 threads per inch and is right handed. To cut a left-hand thread of 14 per inch, the mandrel and the leading screw must be connected by a wheel-train. Sketch the arrangement you would employ, and give the numbers of teeth of the wheels if the change wheels available have from 20 to 100 teeth, rising by five. (20)

12. What is meant by epicyclic gearing? A reverted epicyclic train consists of a wheel A having 50 teeth, gearing with a pinion B having 10 teeth; the pinion gears with an annular wheel C having 70 teeth. Find how many revolutions C makes for each revolution of the arm to which B is pivoted, A remaining at rest. (20)

MINING.

B. Sc. EXAMINATION.

MINING.

FRIDAY, APRIL 6TH :—MORNING, 9 TO 12 30.

NOTE.—Make free use of sketches and indicate calculations if you have not time to carry them out.

1. In prospecting, good "float" is found for several hundred feet along the base of a low heavily timbered ridge and up its slope to within 100 yards of the crest. What method would you pursue in prospecting for the ore body?

2. If in case (1) you find the ore in two places 400 ft. apart; in each discovery a vein of from 4 to 8 inches of high grade silver bearing galena. How would you proceed with the proof and preliminary development of the property?

3. Given a shallow valley two miles broad from crest to crest of the low rocky hills bordering it. The valley was once eroded to an average depth of 100 ft. below present surface and filled with drift and alluvium. A coal seam 5 feet thick outcrops in the hills on each side and dips under the valley, its maximum depth being 500 feet.

If you had a rectangular tract of 1,000 acres along one side of the valley and extending from the outcrop to the center line, state briefly how you would lay out a mine. Outline the general scheme and describe in detail one working place and its connection with the rest.

If the coal were 1,000 feet deep and the drift were clayey, state very briefly what changes, if any, you would make in the general scheme.

4. Describe briefly the method you would use for mining and timbering a large deposit of "heavy" soft ore.

5. Given a vein mine with six feet of good low grade ore of medium hardness dipping 70° and extending about 1,000 feet on the strike.

If the property had been developed by an inclined shaft 1,000 ft. deep with levels at each 100 ft. and stoping going on at 8th, 9th and 10th levels,

(*a*) What would be a large but not excessive output per 24 hours?

(*b*) To get this output, would you use hand or power drills, and how many men or machines would be needed if working three eight-hour shifts?

6. In case (5). If the shaft had a double hoist, each skip weighing 1 ton and carrying 2½ tons, with arrangements for loading from chutes, and for automatic unloading into bins 50 feet above the shaft mouth, state the general features of the hoisting plant and determine the approximate horse-power of the hoisting engines.

7. Name the several methods of ventilation commonly used in mines, and describe one of them in some detail.

Define brattice, sollar, split, upcast, airway and return.

8. Describe a Cornish pumping plant for unwatering a mine 1,000, feet deep and making 200 gallons of water per minute.

What should be the horse-power of the engine and what its approximate "duty?"

Give very briefly the characteristics of the Rittinger or differential-pump as applied to this case.

Would it be advisable to use a direct acting steam pump system in place of the above? Give briefly your reasons for preferring one to the other.

THIRD YEAR.

ORE DRESSING.

THURSDAY, APRIL 5TH:—MORNING, 9 TO 12.

(Answer 1, 2, and any other eight.)

1. Assuming the formula for free fall of spheres in water

$$v = 1.63 \sqrt{\frac{}{}g\ (\delta - 1) - \delta d\ p.}$$

How do you get an expression for the rate of uniform fall, and what effect have variations in the shape of the particles?

2. Assuming the following specific gravities—Pyrite 5, Quartz 2.5,

(*a*) What would be the diameter ratios of equal falling particles of same shape?

(*b*) What difference in size would just permit of a separation of the largest quartz and the smallest pyrite?

3. Referring to the expression for velocity of free uniform fall, as derived in answer (1), what effect has crowding of the particles on the coefficient of the radicle and what is the practical limit of this effect?

4. What is meant by crushing in stages, and why is it often desirable to crush in this manner ?

Describe some well-known form of rock breaker.

Describe some well-known form of fine crusher.

5. Describe and sketch some form of rising current classifier.

6. What is the principle of jigging, and why is it that jigs will work on wider ranges of size than the Rittinger formula calls for when the difference in specific gravity exceeds a certain ratio ?

7. (*a*) What is the difference between German and English jigging ?

(*b*) What are the several mechanisms for making the water pulsate ?

8. (*a*) What are the several classes of tables in use for separating slimes ?

(*b*) Describe some one well-known table, giving sketches.

9. (*a*) How does a table effect its separation of heavy from light material ?

(*b*) How can a bumping motion add to the efficiency of this action ?

10. (*a*) What are the general types of magnetic separators ?

(*b*) Describe a form, making use of alternations in polarity, and say why these alternations are useful.

11. What is the ordinary sequence of operations in ore dressing ?

12. Define, using sketches if convenient, Trommel, spitzkasten, toothed roll, edge runner, launder.

13. (*a*) Why is it necessary to dress or concentrate most ores ?

(*b*) Why is crushing resorted to in almost all cases ?

(*c*) Why are the losses usually greater in fine stuff than coarse ?

B.Sc. EXAMINATION.

ORE DRESSING.

THURSDAY, APRIL 5TH :—MORNING, 9 TO 12.

1. Assuming the formula for free fall of spheres in water

$$v = 1.63 \sqrt{dg\,(\delta - 1) - \delta\, dp}$$

How do you get an expression for the rate of uniform fall, and what effect have variations in the shape of the particles ?

2. Assuming the following specific gravities—Gold 19, Galena 7.5, Py-

rite 5, Quartz 2.5, what would be the diameter ratios of equal falling grains of each ?

3. What screen or size ratios would give a separation of quartz and pyrite in rising current separator if all grains of both minerals are of same shape ?

4. Referring to the expression for velocity of free uniform fall, as derived in answer (1), what effect has crowding of the particles on the coefficient of the radicle, and what is the practical limit of this effect ?

5. What is meant by crushing in stages, and why is it often desirable to crush in this manner ?

Describe and sketch the apparatus you would use to reduce fairly hard lump rock carrying mineral to a maximum size of 20 millimeters.

6. Describe and sketch some form of rising current classifier.

7. Describe and sketch some form of jig, and show how three products may be drawn off continuously and automatically.

What is meant by hutch work, middles, hand skimming ?

Why are jigs made with from one to six sieves, and under what conditions are jigs with many sieves used ?

8. What is the difference between German and English jigging ?

What is the reason that jigs with strong suction are very effective on mixtures of some minerals even with wide range of size ; and of little effect on similar mixtures of other minerals.

9. Describe some one good form of non-bumping table for treating fines, and give an explanation of inclined plane separation of fine minerals.

10. Describe some bumping table and show how the action of the bump is of use in inclined plane separations.

11. Describe a magnetic separator, making use of changes in polarity and explain why these changes increase its efficiency.

Describe the working of the Wetherill machine. Why is it ill adapted to commercial work on magnetite sands ?

12. Give in outline a mill to treat 200 tons a day of medium rock carrying about 8 p.c. of bornite and chalcopyrite and $\frac{1}{2}$ oz. of gold, the latter being all in the sulphides.

THIRD YEAR.

METALLURGY.

TUESDAY, APRIL 3RD:—MORNING, 9 TO 12.

1. Discuss refractory materials, showing character, advantages and disadvantages of the several in use.

2. What is a shaft furnace? What is a reverberatory? What is the character of the operations which may be carried on in each?

3. Sketch an iron blast furnace, naming the principal parts. Show on your sketch what chemical actions are going on in different parts of the furnace and give the chemical reactions.
What is a stove? Indicate in a sketch the method of working.

4. What is puddling? What product is obtained? Does it successfully treat high phosphorus iron?
What is the meaning of "Direct Process?" Describe a direct process.

5. What is the Chemistry of the Bessemer Process? How can you treat iron high in phosphorus in the converter?

6. What is the open hearth process? What is the chemistry of the process?

7. What is cementation? What is the crucible process, and what, if any are its advantages?

8. Describe the methods and theory of producing either charcoal or coke.

9. What is the principle of regeneration? What conditions limit the temperature which can be reached?

10. What is the calorific power of a fuel? What is the calorific intensity? By what means can we arrive at their values, and are the values absolutely correct? Give reasons for your answer.

B.Sc. EXAMINATION.

METALLURGY.

WEDNESDAY, APRIL 11TH:—MORNING, 9 TO 12.

1. Describe a by-product coke oven. What advantages have by-product ovens over bee-hive ovens?

2. What is a gas producer? Describe two types. With what kinds of fuel does the producer show greatest economy?

3. What are the principles of regeneration, and what are the limiting conditions? What is a recuperator?

4. Describe two types of pyrometer, including one seen in the laboratory.

5. Calorimeter test:

Weight of iron wire used = .01 gr.

Water in Calorimeter = 2300 grs.

Water equivalent of Calorimeter 481 grs.

Coal used = 1 gr.

Neglect the formation of heat produced by acids.

Heat of combustion of 1 gr. of the wire = 1.6 calories.

Preliminary Period.		Cumbustion.		After Combustion.	
min.	degrees.	min.	degrees.	min.	degrees.
0	17.767	4	20.16	7	20.56
1	17.760	5	20.57	8	20.54
2	17.753	6	20.58	9	20.52
3	17.746		(max.)	10	20.50

Find calorific power of coal.

6. Discuss the effect of various elements on iron.

How is cast iron graded, and what objections do you see to the methods in use?

7. What is effect of adding Nickel to Steel, of Chromium, of Tungsten, of Manganese?

8. What constituents are now recognized as present in steel? What are the modern theories of hardening?

9. What is brass? What is bronze? What are the common impurities and what are their effects? What properties of bronze does an addition of aluminum affect, and how; of Phosphorus; of Silicon?

10. What metals enter into composition of the so-called "Babbitt metals?" What gives hardness, what gives brittleness, what gives toughness, what gives softness?

B.Sc. EXAMINATION.

METALLURGY OF GOLD AND SILVER.

TUESDAY, APRIL 3RD :—MORNING, 9 TO 12.

1. Describe in detail with sketches the method of carrying water from a stream in high land to an extensive hydraulic working thirty miles distant. Assume topography proper to placer mining country.

2. Describe the Patio process and state the conditions under which it is now used. What are the materials used, and what are the chief sources of loss ?

3. What are the moving parts of a stamp battery ? Define and sketch shoes and dies, stem, tappet, cam and jack shaft.
What is meant by low and high drop, and height of discharge, and what is the effect of varying each ?

4. What is the difference between battery and plate amalgamation ?
Why and how are plates silvered and how are they dressed ? Describe a clean up.

5. What are the more common methods of treating stamp mill tailings ? Describe two cases at some length.

6. Describe the cyanide treatment for gold ores, indicating what chemical reactions are generally assumed to take place, and what constituents in ore are prejudicial to the success of the process.

7. Describe the barrel method of chlorination.

8. What materials are available as precipitants for gold from its various solutions, and what are the advantages and disadvantages of each?

9. What solvents may be used for silver ores, and in what forms should the silver be ?

10. What is pan amalgamation? What are the sources of loss, and how may losses be prevented ?

FOURTH YEAR.

ADVANCED METALLURGY.

APRIL 10TH :—AFTERNOON, 2 TO 5.

1. Given three ores with chemical composition as follows :—

	SiO_2	FeO	CaO	S.
1	25	12	0	10
2	5	50	0	—
3	2	0	52	—

How would you mix them in order to obtain a slag which would contain 30 SiO_2, 40 FeO, 20 CaO?

2. Given a matte containing 20 p.c Copper, 48 p.c. Iron (metallic), 32 p.c. Sulphur. How would you treat it to make a 50 p.c. matte? How much slag would result and what would be the percentage loss in Copper if the slag showed by analysis 50 FeO, 30 SiO_2, 5 Cu, 15 Al_2O_3?

3. Describe the operation of the Belgian method of treatment of zinc ores. What are the principal differences between it and the Silesian method?

4. Describe the crucible process for smelting antimony, giving the chemical reactions.

5. Describe the reverberatory method of treatment of tin ores, indicating the difficulties encountered. How is crude tin refined?

6. What is the usual method of obtaining aluminum? What compounds are available as a source of aluminum, and what are the advantages and disadvantages of each?

7. What difficulties are encountered in the electrolytic refining of copper, and how are they surmounted?
Describe with chemical reactions Hoepfner's process of electrolytic treatment of sulphide ores and mattes.

8. What difficulties are encountered in electrolysis of Zinc compounds in aqueous solution?
In what way can electrolysis be most successfully applied to the production of metallic tin?

THIRD YEAR.

ROAD CONSTRUCTION.

SATURDAY, 7TH APRIL:—MORNING, 9 TO 12.

1. Describe the location, construction and maintenance of a road built of the local soil.

2. Discuss the effect of wide and narrow tires on roads. What is the effect of grade upon the usefulness of a road?

3. Describe the construction of an asphalt pavement for a street, giving average costs and mentioning all precautions that must be taken to ensure satisfactory results.

4. What is the effect of a street car system upon the life of a pavement? Sketch one form of rail in general use for street railways and explain the reasons for its adoption.

5. Describe briefly the cast-welding of joints, and show why a rail thus jointed can be successful in practice.

6. Mention the various facts that must be considered before choosing a pavement for any particular street.

7. How would you test brick that was to be used for street paving purposes ?

B.Sc. EXAMINATION.

RAILWAY ENGINEERING.

THURSDAY, APRIL 12TH :—9 A.M.

1. In selecting a route for a railway between determined termini, what features of the intervening country would you study ?

2. State what proportion the payments for interest, for transportation and for general expenses are of the total expenditure of a railway. Discuss briefly the effect of good or bad location upon them.

3. How much tractive power can be developed by a locomotive ? State briefly how this power is developed and transmitted by the machine, and explain the necessary proportions of its principal parts.

4. What resistances have to be overcome when a train is in motion ? Give an average value for each of them.

5. How would you proceed to estimate what the area of a stream would be at its time of maximum flood ?

6. Explain why timber trestles are so much used on Canadian railroads, and draw a sketch showing a usual type of such structures.

7. Discuss the causes which govern the design of a pier for a bridge over a Canadian river. Illustrate the provisions made for the effects of the causes you mention by a sketch of a pier 20 feet high, giving approximate dimensions to each part.

8. Shew by sketches or description the parts of the standard track of a Canadian railroad. What weights of rail are in common use ? Discuss the design of a standard rail.

9. Draw a sketch of a 3-throw stub switch and accompanying frog, and calculate the correct positions for the headblock and frogs, the numbers of the main frogs being 10 and 8.

10. Describe clearly all the investigations of the natural soil at a bridge site that you would make before erecting the piers on it.

THIRD AND FOURTH YEAR EXAMINATION (*Civil Eng. Course.*)

MUNICIPAL ENGINEERING (SEWERAGE).

MONDAY, APRIL 23RD :—9 A.M.

1. Describe the probable sanitary condition of a town unprovided with a sewerage system, and state the beneficial results which may be expected to follow its introduction.

2. Make a comparison between *combined* and *separate* systems.

3. What are the governing factors in the determination of the size and inclination of the mains and laterals of a separate system? What is the minimum inclination for a 12 in. pipe?

4. What is meant by the ventilation of a sewerage system, and why is it necessary?

5. In making the design explain how you would provide for *flushing* and *inspection.*

6. What data would you consider it necessary to obtain in order to make a preliminary plan and estimate of cost?

7. State two methods of sewage disposal which might be adopted in the case of a town remote from any large body of water.
Describe one of them in detail.

8. Write a short description of the micro-organisms known as bacteria.

Faculty of Law.

FACULTY OF LAW.

FINAL EXAMINATIONS FOR DEGREE OF B.C.L.

ROMAN LAW. (*First Paper.*)

SATURDAY, APRIL 7TH :—10 TO 1.

Examiner .....PROF. WALTON

1. Explain the terms *jus vetus* and *res mancipi*.

2. Define *agnatio*, and explain it as fully as you can.

3. Describe the *jus gentium*. What parts of the law did it include?

4. What were the rights of the husband in the *dos*, *stante matrimonio?*

5. What distinction did the Roman law make between a pupil and a minor in respect of contractual capacity, and right of relief from contract?

6. How was *manus* created? How was marriage constituted in the time of Justinian?

7. What is *treasure?* To whom does it belong?

8. What is meant by *brevi manu traditio?*

9. Explain the difference between a real and a personal right.

10. Explain and illustrate the doctrine of *accessio*.

FINAL EXAMINATIONS FOR DEGREE OF B.C.L.

ROMAN LAW. (*Second Paper.*)

SATURDAY, APRIL 7TH :—3 TO 6 P.M.

Examiner .....PROF. WALTON.

1. The farm of A. enjoys the servitude of drawing water from a well on the farm of B. A. is absent abroad. For 32 years his farm is occupied by a *mala fide possessor* whose servants make use of the servitude. A. returns and evicts the possessor. Has the servitude been extinguished? Explain.

2. What sorts of things may a usufructuary enjoy? Discuss his rights as to minerals, trees or islands formed during the usufruct, and belonging to the owner of the land usufructed.

3. What are the essential requisites of emphyteusis? A farm held in emphyteusis is partly submerged by the sea, and so remains. Can the lessee claim diminution of rent?

4. Trace briefly the history of the praetorian will.

5. A. is about to make his will. He has one son and one daughter in his *potestas*, an emancipated son, a mother, a brother and a sister. Have all or any of these persons any claim to a share of his estate? Suppose a person having such a claim is passed over, what is his remedy?

6. A. who dies intestate, after Justinian, leaves a paternal grandfather, a maternal grandfather and a maternal grandmother, a sister and three nieces, the daughters of a deceased sister. How is his estate divided? Explain.

7. What was meant in the Roman law by the terms "real contract" and "verbal contract"?

8. Explain *vis et metus* as a cause of nullity of contract.

9. Classify indivisible obligations, and give examples.

10. A. in 1898 lends B. $500. In 1900 B. gives A. a promissory note for the debt. In 1906 A. sues B. for payment. How may it be for B's interest to prove that in 1900 there was novation? Upon which side is the presumption?

FINAL EXAMINATION FOR DEGREE OF B.C.L.

CONSTITUTIONAL LAW.

TUESDAY, APRIL 10TH :—3 TO 6 P.M.

Examiner, ... PROF. WALTON.

1. What is the legal nature of the succession to the crown? Illustrate from history.

2. The royal will is official, not personal. Explain.

3. Is the Lieutenant Governor an Imperial or a Dominion official?

4. Give an outline sketch of the history of the House of Lords, and discuss its present powers.

5. Into what classes are colonies divided? Give examples. How does the distinction affect the powers of the Crown?

6. Explain some of the political grievances treated of in Lord Durham's report.

7. Explain the liability of a governor of a colony to the Courts of Law.

8. What are the general principles applied by the Imperial government as to the disallowance of a Colonial Act?

9. Enumerate the principal matters as to which the Parliament of Canada has exclusive authority to legislate.

10. What rules have been laid down by the Judicial Committee of the Privy Council as to the power of a province to pass laws dealing with (*a*) Liquor Traffic, and (*b*) Fisheries.

FINAL EXAMINATION FOR DEGREE OF B. C. L.

HISTORY OF LAW, AGENCY AND PARTNERSHIP AND CORPORATIONS.

WEDNESDAY, APRIL 11TH :— 3 TO 6 P.M.

Examiner, ... PROF. MCGOUN.

1. What was the *retrait lignager* in customary law, and how has it disappeared from our law?

2. What is the date of the ordinance of Mortmain in France? Was it registered in Canada? What enactment contained the law of Canada in relation to this subject?

3. What was the ordinance of General Murray passed in September, 1764?

4. When was the Writ of Summons introduced, and when the Writ of Capias ad respondendum?

5. Distinguish between a Mandatary and a Negotiorum gestor.

6. In an account by an agent, from what time is interest due on money employed by agent for his own use, and on balance due to the principal?

7. What is a *del credere* commission?

8. What is the holding in *Reid & Macfarlane* as to the rule that participation in profits carries with it an obligation to contribute to the losses?

9. What does the declaration of a limited partnership contain, and what

are the consequences of a failure to file such a declaration or of a false statement therein ?

10. (*a*) How are corporations created ?

(*b*) Outline procedure to obtain incorporation of a joint stock company by Provincial Letters Patent.

11. To what companies do the General Clauses Act of the Province of Quebec apply, and how are its provisions given effect to ?

12. How is the stock of a defaulting shareholder forfeited ? When does he remain liable for unpaid calls ?

13. What is preference stock ?

14. By what process can companies violating their charter or persons illegally assuming corporate powers be attacked ?

15. How does the law stand with respect to powers of Companies to become judicial sureties ?

FINAL EXAMINATION FOR DEGREE OF B.C.L.

MARRIAGE COVENANTS—PRESCRIPTION—LEASE AND HIRE—MINOR CONTRACTS—MUNICIPAL LAWS.

MONDAY, APRIL 9TH :—3 TO 6 P.M.

Examiner,..... .... PROF. FORTIN.

1. An immoveable belonging to the wife is sold and the price thereof paid into the community ; what recourse has the wife and when can such recourse be exercised ?

Quid, if a sum of money is withdrawn from the community and used to improve an immoveable belonging to one of the consorts ?

2. How is replacement (*remploi*) effected :

(*a*) As regards the husband ?

(*b*) As regards the wife ?

Give the reasons for the difference.

3. Endowments are made by the husband with property belonging to the community :

1. To a child born of his previous marriage ;
2. To the child of a friend ;
3. To a common child :

What is the liability of a community in each case, and for what reasons?

4. How is community re-established after judicial separation, and what is the effect of such establishment?

Quid, as regards new agreements made by consorts?

5. The wife inherits one undivided third of an immoveable, which is sold by licitation and bought by the husband. Such immoveable is sold by the husband during marriage:

What recourse has the wife?

6. What is the essential difference between loan for use and loan for consumption?

What are the rights of the borrower in each case?

7. What is deposit? What are the obligations of the depositary?

What is sequestration, and when can it take place?

8. What is interversion of title? How is it effected?

Explain the rule that no one can prescribe against his title.

9. What right has the lessor:

1. Upon the moveable effects of the lessee?

2. Of sub-tenants?

3. Of third persons?

Quid, as regards sub-tenants, when there is a prohibition to sublet?

10. Describe the composition of local and county councils, and state how the members of local councils are appointed.

How is the appointment contested:

1. When made by the rate payers?

2. When made by council?

3. When a member becomes disqualified to act as a councillor, after having been duly elected?

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FINAL EXAMINATIONS FOR DEGREE OF B.C.L.

GIFTS, SUBSTITUTIONS AND SUCCESSIONS.

SATURDAY, APRIL 14TH:—10 A.M. TO 1 P.M.

Examiner, ...MR. JUSTICE DOHERTY.

The entire paper to be answered by Graduating Class. First Five Questions only by Second Year.

1 (*a*) A. gives, *inter vivos*, to B. a specific property which he (A.) intends to acquire, agreeing that, immediately on his acquiring it, it shall pass to B. under the donation.

(*b*) A. by donation, *inter vivos*, gives to B. a sum of $10,000, payable at A.'s death. At the time of the donation A. is penniless.

(*c*) A. by donation, *inter vivos*, gives to B. a sum of $10,000, to be paid out of the property of A.'s succession after his death.

In each case is the disposition valid? To what extent would the validity of the disposition in each case be affected, if it were made in a marriage contract, B. being one of the consorts?

Reasons for your answers.

2. B., believing himself owner of a certain property which belongs to A., gives it to C.

What is the effect of the donation? How would the rights of C. be affected by B.'s subsequently inheriting the property in question from A.?

3. A. makes a gift to B. The latter, not being present to the deed, accepts by a subsequent deed to which A. is not present. B. dies before this acceptance is notified to A. Can B.'s heirs claim the property given?

If, in the same case, A. dies before notification of the acceptance and B. be still living, could B. claim the property given from A.'s heirs?

Reasons for your answers.

4. What persons may invoke the non-registration of a gift? What persons can invoke the non-registration of a substitution?

5. A. by donation in a contract of marriage gives all the property of which he will be possessed at his death to B., one of the consorts, providing that B. shall have the usufruct thereof, that, at B.'s death, the property shall pass to the children of B., after the death of said children to their children, and, after the death of the latter, to their children, B.'s great grand-children?

Is the disposition in favor of B. valid? If so, what is the nature of his rights in the property? What do you call the disposition made in favor

of B.'s descendants? Can the disposition in favor of B.'s great grand-children produce any effect? If so, when, and what effect? If not, why not?

6. A., aged 50, and his two sons, B. aged 18, and C. aged 14, perish by the same accident. It is impossible to establish the order of their deaths.

A., who was but once married, has made no will, and leaves surviving him his wife, two children and one grand-child, son of a pre-deceased child.

To whom do the successions of A., B. and C. respectively devolve, and how are they divided?

Reason for your answers.

7. A. called to the ab-intestate succession of B., and who has neither accepted or renounced, brings action against C. to recover a debt due to B.'s succession?

C. pleads that A., not having accepted the succession, has no right of action.

Is the plea well founded? Would it be so if made to a similar action by A. as universal legatee of B.?

Reasons for your answers.

8. A. makes a will bequeathing all his property to B, and charging him with particular legacies in favor of different persons. B. predeceases A. What is the effect upon the particular legacies? Can the particular legatees claim them? If so, from whom? Reason for your answers.

9. A., who is owner of a particular property for part only, bequeathes the property to B. In the partition effected before A.'s death no part of the property is allotted to A. What is the effect on the legacy to B.? What would be the rights of B. if the partition were effected only after the death of A. with a similar result? Reason for your answer.

10. A. bequeathes his estate to B., with substitution in favor of B's. children.

B. survives A., takes under the will, and dies leaving no children, but only grand-children? What rights, if any, have the latter under the will? Reason for your answer.

day, that in the divorce proceedings only nine days had intervened between the issuing of the writ and the day it was returnable, and that in consequence the Florida court had no jurisdiction. Should this defence prevail?

10. A Quebec creditor obtains judgment against a debtor also domiciled in this province, but who is temporarily employed in Massachusetts by an American railway company, his wages being payable in Boston. The railway company operates a section of leased railroad in this province and has branch offices there, so that they can be served with process and brought before our courts. The judgment creditor issues an attachment by garnishment and serves it on the railway company at one of its stations in this province, and the company declares that the defendant is in its employ in the United States, and that his wages are payable there. Can the attachment be maintained?

11. Enumerate the principal disabilities of aliens in the Province of Quebec.

12. What is the domicile of origin of:—

(*a*) a legitimate infant born during his father's life-time;

(*b*) an illegitimate infant;

(*c*) a posthumous infant;

(*d*) a foundling;

(*e*) a person legitimated *per subsequens matrimonium*?

FINAL EXAMINATIONS FOR DEGREE OF B. C. L.

CRIMINAL LAW.

THURSDAY, APRIL 12TH:—AFTERNOON, 3 TO 6 P.M.

Examiner.....THE HON. MR. JUSTICE DAVIDSON

SECOND AND THIRD YEAR STUDENTS.

1. Do common law offences still exist in Canada? State reasons for your decision. Can you mention a decision on the point?

2. When is natural imbecility or disease of the mind or specific delusion an excuse for crime? Through what three stages has the criminal law of Insanity passed?

3. What is the difference between an aider and abettor and an accessory before the fact? Who is an accessory before the fact?

4. Draw an indictment for riot. What additional allegations would be needed if the proclamation had been read ?

5. What is "forcible entry and detainer ?"

6. When does a child become "a human being ?"

7. (*a*) Define culpable homicide and homicide which is not culpable ?

(*b*) What is the leading distinction between murder and manslaughter ?

(*c*) A. procures by false evidence the conviction and death of B. Is this either murder or manslaughter ? State reasons for your opinion, and a case on the subject.

(*d*) A. aids B. to commit suicide. Is A. an aider and abettor of either murder or manslaughter ? State reasons for your opinion. Draw an indictment.

8. When can a husband be convicted of stealing the property of his wife, and a wife the property of her husband ?

9. When was the first law passed in this Province providing for the writ of Habeas Corpus,

(*a*) in relation to any criminal or supposed criminal offence ?

(*b*) in relation to a restraint of liberty otherwise than for some criminal or supposed criminal matter ?

(*c*) Where are the existing laws to be found for these writs ?

FOR THIRD YEAR ONLY.

10. Jean Baptiste Sipido, a Belgian subject at Brussels, shoots at the Prince of Wales with intention to kill him. His Royal Highness is not injured.

(*a*) Of what crime would Sipido be guilty according to English criminal law ?

(*b*) If arrested in England, could he be tried there ? State reason for your opinion.

11. What is the difference between "slander and libel ?" Name two celebrated English statutes on the law of libel. State briefly the important rights which they assert.

12. After preliminary inquiry the Magistrate discharges the accused. What are the rights of the prosecutor ? What change in the previous law has the Code made in this respect ?

13. What is the object (1) Of the Extradition Act ? (2) Of the Fugitive Offenders' Acts ?

COMMERCIAL LAW.

SALE—BILLS AND NOTES.

FRIDAY, APRIL 20TH:—10 A.M. TO 12 P.M.

Examiner,..... PROF. R. C. SMITH.

1. Define the contract of sale, and discuss in relation to it the question of tradition before and since the Code.

What is the effect of the holding in Cushing & Dupuy and in Church & Bernier?

2. What is the *jus disponendi*? Does it exist in our law?

3. What is the effect of a promise of sale with tradition and actual possession?

A delivers to B a safe under an agreement by which B undertakes to pay certain instalments, with the stipulation that upon payment of the last instalment the safe shall belong to B. When does the property in the safe pass?

4. What is the difference between sale *en bloc* and sale by weight, measure, etc?

Which is each of the following:—

(*a*) A sells B 1,000 lbs. of the coffee in A's warehouse at 40c a pound.

(*b*) A sells B 1,000 lbs. of the coffee in A's warehouse for $400.

(*c*) A sells B all the coffee in A's warehouse at 40c a pound.

(*d*) A sells B all the coffee in A's warehouse for $800.

(*e*) A sells B all the coffee in A's warehouse, to wit, 2,000 lbs. for $800.

5. What rights has an unpaid vendor in this province?

6. Define a bill of exchange, a cheque and a promissory note.

7. What is meant by a holder in due course, and what are his rights?

8. What is necessary to constitute a valid acceptance? What is a general and what a qualified acceptance?

9. When a bill is dishonoured, what are the holder's duties? Are they the same in all the provinces?

10. How may judgment be obtained on a lost bill?

FINAL EXAMINATIONS FOR DEGREE OF B. C. L.

COMMERCIAL LAW—(*Second Paper.*)

CARRIERS—AFFREIGHTMENT—INSURANCE.

FRIDAY, APRIL 20TH :—3 TO 6 P. M

Examiner..... PROF. R. C. SMITH.

1. To what extent may carriers limit their liability by notice of special conditions?

2. Define "General Average," "Particular Average" and "Petty Average."

3. A ticket is bought in Hong Kong from the P. & O. SS. Coy. Upon suit brought against the Company by the passenger in France, what law will decide the rights and obligations of the parties on the ticket?

4. What are the obligations of the master and owner under a Bill of Lading?

5. What is meant by insurable interest? May a policy be transferred to one who has no insurable interest in the object of it? Is there any difference in this respect between marine, fire and life policies?

6. What is the effect of misrepresentation of a fact calculated to diminish the appreciation of the risk? Is it the same if the misrepresentation be made through error as if made by design? *Quid*, if the loss do not in any degree arise from the fact misrepresented?

7. How does over-valuation of the object affect the insured's rights in case of loss (*a*) when fraudulent, (*b*) when without fraud?

8. What losses is the insurer liable for under a fire policy?

FINAL EXAMINATIONS FOR DEGREE OF B. C. L.

CIVIL PROCEDURE.

SECOND AND THIRD YEARS.

TUESDAY, APRIL 17TH :—10 A.M. TO 1 P.M.

Examiner,..... PERCY C. RYAN, B.C.L.

(*Questions for the Second and Third Years.*)

1. Explain what is meant by Execution in civil actions. What are the different kinds of execution?

A sues B for $100 damages for libel. B makes default to appear and A obtains judgment for the full amount claimed. Can A have B arrested for failure to satisfy the judgment? If so, under what conditions and upon observing what formalities, and draft the initial proceeding.

2. Write upon the effect of private assignments. What status has the assignee before courts of justice?

3. What is a judicial abandonment? By what persons can it be made? What is its effect (*a*) as against the debtor; (*b*) as against creditors.

A is a trader. He retires from business, and subsequently incurs debts by indorsing for B, a trader. Can A be compelled to make a judicial abandonment. State the rule clearly.

4. What are the effects of sheriffs' sales?

5. A sues B for $500 upon a promissory note. B has a domicile in the Province, but A is not aware of the fact, and has him called in by advertisement as an absentee defendant. Within what delay can B attack the judgment and by what proceeding?

6. Under what conditions can a judgment be attacked upon the ground that new evidence has been discovered since it was rendered?

State the nature of the appropriate proceeding, and within what delay it should be taken.

7. How can a debtor subject to coercive imprisonment obtain his liberation?

8. In what cases, in what manner and within what delay, can appeals be brought from interlocutory judgments?

9. Can an intervention be made when a suit is pending before the Court of Review from a final judgment? Outline the proper procedure.

10. A sues B for $100, alleged to have been lent. State whether the following admissions by B are divisible:

(*a*) I received the money, but not as a loan; it was given to me.

(*b*) I received the money on the date in question, but I paid it back three months afterward.

(*c*) I received the money on the date in question for the purpose of making a deposit. Half an hour after receiving it, I found the money would not be required and I returned it.

(*d*) I received the money in payment of a debt.

11. What are the requirements which must be satisfied to constitute a judicial admission?

12. State in what cases secondary evidence is admissible.

Additional questions for the Third Year only.

13. A contracts with B in the district of Montreal to build a house in the district of Terrebonne. B resides in the district of Sherbrooke. A wishes to sue B for damages arising from B's alleged failure to carry out his contract. In what district or districts can the action be brought? State the rules.

14. What are the classes of possessory actions? Distinguish between them, and distinguish them from petitory actions.

Can the possessory and the petitory action be joined?

FINAL EXAMINATIONS FOR DEGREE OF B. C. L.

OBLIGATIONS.

TUESDAY, APRIL 10TH:—10 TO 1.

Examiner, ... A. GEOFFRION.

1. Explain fully what is a natural obligation. Give its principal effects.

2. In cases of doubt in whose favor must a contract be interpreted? In the same cases in whose favor must a release be interpreted? Are those rules contradictory? Give reasons.

3. A minor, old enough to know what he does, unassisted by his tutor, an interdict for insanity during a lucid interval, unassisted by his curator, a married woman unauthorised by her husband, cause damage to somebody by their illegal act. Are they responsible in damages? While in the same state, and still acting alone, they settle with the victim, as they consider themselves responsible, by giving a note for the amount which is agreed to as representing the damage caused. Can that settlement be attacked (*a*) by either of them, (*b*) by the victim? Has the advantageous or disadvantageous nature of the settlement any effect on the decision of the question? Give reasons?

4. Can a person held by law for another's fault ever or always invoke the impossibility in which he was to prevent the commission of the fault?

5. I own a vacant lot; my neighbour's house has windows looking on to it, but no right of view existed in his favor. Through malice towards him exclusively, I build a wall that blocks his windows and depreciates the value of his house. Has he any recourse? Give reasons.

6. What is the condition? When is it suspensive, when resolutory? What is a joint and several obligation (*a*) as to the creditors, (*b*) as to the debtors? What is an indivisible obligation? Merely define.

7. In a bi-lateral contract, when one party's obligation is extinguished through impossibility to execute it, what becomes of the other party's corresponding obligation? Is the rule always the same, or must a distinction be made?

8. A. is indebted towards B. C. is surety for the debt. It is subject to the five years' prescription, and four and a half years have elapsed since maturity. D., a disinterested stranger, pays B.; subsequently he finds out that A. is not solvent. He returns to B. and makes him add to the receipt (which is a private writing) a clause subrogating him in his rights. Is C. liable towards D.?

9. I am sued on a debt which has been due for four years. I have a counter claim which has been due for six years. It is subject, however, to the five years' prescription. I offer it in compensation; the plaintiff answers that it is prescribed. Is the answer well founded? Give reasons.

10. I have a claim about to be prescribed in a few days. I do not want to sue, and I cannot get an acknowledgment from the debtor interrupting prescription. But I am indebted towards my debtor. Both debts are for sums of money; they are uncontestable; their amounts are certain and equal, but the debt I owe is not yet due. What can I do to save my claim? Give reasons.

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UNIVERSITY SCHOOL EXAMINATIONS, 1900

Preliminary Subjects.

(In order of date of Examination.)

UNIVERSITY SCHOOL EXAMINATIONS.

PRELIMINARY SUBJECTS.

ENGLISH COMPOSITION

MONDAY, JUNE 11TH:—MORNING, 11 TO 12.

COMPOSITION.

Write an essay of not less than one page on any *one* of the following subjects:

Popularity.
Gardening.
The part of Canada in the Anglo-Boer war.

WRITING.

FRIDAY, JUNE 15TH:—AFTERNOON, 4 TO 4.15.

1. Write all the letters of the alphabet in capitals.

2. Write the numerals from 1 to 20.

3. Write the following:

When descends on the Atlantic
The gigantic
Storm-wind of the equinox,
Landward in his wrath he scourges
The toiling surges
Laden with sea-weed from the rocks.

4. Give your name in full, the name of your school, your age, and state how long you have employed the vertical style of writing, if you use it at all.

ENGLISH DICTATION.

MONDAY, JUNE 11TH:—MORNING, 10.30 TO 11 A.M.

[Note for the Deputy Examiner.—The Deputy Examiner will read the extract *three* times, the candidates writing it out during the *second* reading. The first and third readings are respectively intended to give the candidates a general idea of the character of the passage, and to

guide them in punctuating. *As it is of great importance that candidates should not be left in a state of uncertainty, the Deputy Examiner will repeat, on request, any word or phrase. The Deputy Examiner will also inform the candidates that obvious attempts to make letters do double duty (e. g. to make a letter serve for e or i) will be regarded as mistakes. Full stops and semi-colons are to be indicated by the Deputy Examiner.*]

As soon as we are old enough to get the range of three or four generations well in hand, and to take in large family histories, we never see an individual in a face of any stock we know, but a mosaic copy of a pattern, with fragmentary tints from this and that ancestor. The analysis of a face into its ancestral elements requires that it should be examined in the very earliest infancy, before it has lost that ancient and solemn look it brings with it out of the past eternity; and again in that brief space when Life, the mighty sculptor, has done his work, and Death, his silent servant, lifts the veil and lets us look at the marble lines he has wrought so faithfully; and lastly, while a painter who can seize all the traits of a countenance is building it up, feature after feature, from the slight outline to the finished portrait.

ENGLISH GRAMMAR.

MONDAY, JUNE 11TH:—MORNING, 9 TO 10.30.

(*N.B.—Not more than two questions in each section to be answered. B 6 is compulsory.*)

A.

1. Distinguish between Common and Singular Nouns and Concrete and Abstract Nouns. Give examples.

How is Gender in English marked by Inflexion?

Give the plural of man-of-war, man-servant, Mussulman, Miss Masterman.

2. In what ways are Pronouns used? Give examples.

Shew by means of sentences the differences in the use of *who* or *which* and *that* as Relative Pronouns.

3. Correct where necessary, giving your reasons:—

Wanted a boy to open oysters with a reference.

Try and do this.

You talk quicker than her.
Each of them were ready to go.
I will be drowned; nobody shall help me.

B.

4. Define Voice, Number, Infinitive Mood.
Give the 1st Person Singular, Past Indicative and the Passive Participle of:—
cleave, drink, gild, mean, swell, wake.

5. Define and illustrate by short sentences:—
Retained Object, Subjective Genitive, Adjectival Clause, Verb of Incomplete Predication, Reported Speech.

6. Parse the words in italics in the following sentences:—
The *then* rector *heard* him *say* he was *none* the worse for his *ducking*.
Few people care *for carrying* burdens.

C.

7. How do you classify Adverbs? Give examples.
By what method can Subordinating Conjunctions be distinguished from Adverbs?

8. Analyse:—
(*a*) Then when he saw it could hold no more,
Bishop Hatto he made fast the door.
(*b*) Whether he went to the war or not I know not.

ARITHMETIC.

TUESDAY, JUNE 12TH:—MORNING, 9 TO 10.30.

Answer two questions from each division. All work must be shown; results alone will not be valued.

SECTION I.

1. If the population of Canada be six millions, and the increase by birth and immigration be 1 in 15 per annum, while the loss by death and emigration is 1 in 25 per annum; find the population five years hence.

2. The polar diameter of the earth is 41707796 feet, express this n miles, furlongs, etc.

Find the number of miles in the equatorial radius having given that it is the least number divisible by 2, 3, 4, 5, 6, 8, 9, 10, 11 and 12.

3. A room is 14 ft. 3 in. high, 20 ft. wide and 24 ft. long. There are 4 doors each 8 ft. by 5 ft. 3 in., 2 windows each 10 ft. by 6 ft., a fireplace 6 ft. 6 in. by 6 ft.; find the cost of papering the room with paper 2 ft. 6 in. wide at 20 cents per yard.

SECTION 2.

4. If iron weighs 7.8 times as much as water, find the weight of a plate of iron 8.4 meters long, 1.6 meters wide and 2.5 centimeters thick? Give the weight in kilograms and in tons.

5. How long will it take to walk round a square field containing 100 acres 416 yards at the rate of 4 miles an hour.

6. The second-class railway fare from Paris to Rennes, a distance of 370 kilometres, is 24 francs. If one franc be worth 19½ cents, compare this rate with the Canadian second-class rate of 2 cents a mile.

SECTION 3.

7. Find the interest on $6,200 from 1st of July to the 17th of November of the same year at 6 per cent. per annum. Find also the true discount on $1,626 due 2 years 7 months hence at 5 per cent per annum simple interest.

8. A person invests $12,000 in 3 per cent. stock at 75, and when it rises to 78 sells out and invests the proceeds in 8 per cent. stock at 208. Show that his income is not altered.

9. I send to my agent in Halifax $6,120 to invest in apples at $1.50 per barrel, he deducts his commission of 2 per cent. and invests the balance. At what must I sell per barrel to make a clear profit of 20 per cent., after paying insurance at 1 per cent. and $80 freight on the shipment?

GEOGRAPHY.

FRIDAY, JUNE 15TH—AFTERNOON, 2 TO 3.

(N. B. Answer two questions only from each group.)

A

1. (*a*) Draw diagrams showing what is meant by *zones, parallels of latitude, meridians.*

(*b*) Mention some of the more important animals of the torrid zone.

2. Draw a map showing the chief bays and islands which a ship would pass in sailing from Quebec to Boston.

3. Where and what are *Tacoma, Albuquerque, Galveston, Guadalupe, Yukon, Ungava, Windward Islands, Valparaiso, Monte Video.*

B

1. Draw a map of South America showing the Andes Mountains and their highest points, and making the course of the rivers Amazon and Parana.

2. Describe the climate and products of the West Indies.

3. A vessel sails from St. John, New Brunswick, to Havana and thence to Halifax; what freights would she probably carry?

C

1. Draw a map showing *Cape Colony, Natal, Rhodesia, The Orange Free State, The Transvaal,* and the chief town of each.

2. (*a*) Name the 5 great oceans and give their position.

(*b*) Define the following and give examples:—*a gulf, a channel, an estuary, an archipelago, a mediterranean sea.*

BRITISH AND CANADIAN HISTORY.

TUESDAY, JUNE 12TH:—MORNING, 10.30 TO 12.

A.

BRITISH HISTORY.

(*Candidates will answer any three parts of the first three questions and question four.*)

1. (*a*) Describe the great deeds of King Alfred;
(*b*) the policy of Henry II towards Ireland;
(*c*) the origin and nature of the Lollard movement;
(*d*) the part of Edward IV. in the Wars of the Roses;
(*e*) the attempts to overthrow Henry VII.

2. What possessions did the English crown secure by
(*a*) the marriage of Henry II;
(*b*) the Treaty of Bretigny;

(*c*) the Treaty of Troyes;

(*d*) the Peace of Utrecht;

(*e*) the Treaty of Paris, 1763?

3. Explain the circumstances of:

(*a*) Babington's Conspiracy;

(*b*) Hampden's refusal to pay Ship Money;

(*c*) the Sacheverell Trial;

(*d*) the passing of the Stamp Act;

(*e*) the Battle of the Baltic.

4. Assign dates to:

(*a*) the Union of England and Scotland;

(*b*) England's recognition of American independence;

(*c*) the beginning of the Peninsular War;

(*d*) Catholic Emancipation;

(*e*) the Indian Mutiny.

B.

CANADIAN HISTORY.

(*Candidates will answer any three parts of the first three questions and question four.*)

1. Describe:

(*a*) the exploration of the St. Lawrence to 1608;

(*b*) the wars of the French and Iroquois;

(*c*) the French expeditions against New England in the 16th century.

(*d*) the connection of Lakes Champlain and George with Canadian history.

(*e*) Pontiac's Conspiracy.

2. (*a*) Mention the occasions when Quebec has been either attacked, occupied, or restored by peace to its former possessors;

(*b*) Mention five important events in the history of Acadia;

(*c*) Give an account of English military operations in the Seven Years War prior to 1759;

(*d*) Name five important events in the history of the Two Canadas, 1837-1867;

(*e*) Write what you know of the history of Manitoba.

3. Make clear notes on :

(*a*) the Hudson's Bay Company ;
(*b*) the early history of Montreal ;
(*c*) battles on the Great Lakes ;
(*d*) the Quebec Act ;
(*e*) Tecumseh.

4. Assign dates to :

(*a*) the landing of Cabot ;
(*b*) the appointment of Frontenac ;
(*c*) the exploit of Dollard ;
(*d*) the fight between the Chesapeake and the Shannon ;
(*e*) the "Papineau War."

NEW TESTAMENT HISTORY.

FRIDAY, JUNE 15TH :—AFTERNOON, 3 TO 4.

N.B.—*Answer any two questions in each group.*

A.

1. Who was (*a*) Theophilus, (*b*) Zacharias, (*c*) Anna, (*d*) Simeon, (*e*) Cyrenius, (*f*) Gamaliel, (*g*) Rhoda, (*h*) Lydia

2. Give a short account of our Lord's interview with (*a*) Nathanael, (*b*) Nicodemus.

3. Write an account of the healing of the impotent man at Bethesda.

B.

4. (*a*) How many instances of our Lord's restoring sight to the blind are recorded ?
(*b*) Describe each briefly.

5. Describe the miracle wrought by our Lord near Tyre and Sidon.

6. Write short notes under each of the following :—Prætorium, Gabbatha, Annas, Bethany, Golgotha, Veil of the Temple, Aceldama, Mary Magdalene, Malchus, Cedron.

C.

7. Give a concise description of what happened "when the day of Pentecost was fully come."

8. Write a detailed account of St. Paul's doings from the time he left Ephesus till he arrived at Assos.

9. What part did Festus take in the proceedings against St. Paul ?

TAYLOR'S "OUTLINES OF MODERN HISTORY."

FRIDAY, JUNE 15TH:—AFTERNOON, 3 TO 4.

Candidates will answer one part of question 1, *two parts of question* 2, *and five parts of question* 3.

1. (*a*) Outline the condition of British colonies during the present century.

   (*b*) What was accomplished at the Berlin Congress of 1878?

2. (*a*) Describe the English system of government and explain its advantages.

   (*b*) Explain the scope of the Reciprocity Act, 1823.

   (*c*) Write what you know of the Chinese War, 1857.

3. Make notes on:

   (*a*) Reform of the Poor Laws;

   (*b*) English County Councils;

   (*c*) the Holy Alliance;

   (*d*) the Abyssinian War;

   (*e*) the Slave Trade Expedition to Zanzibar;

   (*f*) the work of Rivers Wilson in Egypt;

   (*g*) the Post Office Savings Banks;

   (*h*) the results of the Franco-German War.

Optional Subjects.

Optional Subjects

OPTIONAL SUBJECTS.

I. LATIN COMPOSITION.

WEDNESDAY, JUNE 13TH :—9 TO 10 A.M.

1. If you wish anything, return on the Ides of April.

2. Sometimes the gods grant us prosperity that we may suffer more keenly from a change.

3. At daybreak ; late in the day : on that day ; at the usual interval.

4. He ordered (*iubeo*) them to furnish a supply of grain. He ordered (*impero*) them to rebuild their town.

5. Can you not judge from this how much advantage firmness has ?

6. He persuades the senate to call him friend.

7. They are afraid that, if all Gaul is subdued, the army of the Roman people will winter among the Germans.

8. For many years he did not go to Rome.

9. A fierce battle was fought at Cannae.

10. If they are spared, good men will be harmed.

LATIN GRAMMAR AND TRANSLATION AT SIGHT.

WEDNESDAY, JUNE 13TH :—10 TO 11.30 A.M.

A.—LATIN GRAMMAR.

1. Decline miles, domus, vis, equus acer, ambae manus, hic dux.

2. Give the Comparative and Superlative of similis, tenax, miser, dexter, senex.

3. Write down the perf. subjunctive of sum, the future indicative of polliceor, the imperatives of fugio, and the present indicative of malo.

4. Give the principal parts of scribo, tango, sterno, veto, vinco, vincio, solvo, sero (*sow*).

5. Form adverbs from the following adjectives: asper, falsus, brevis primus. Compare saepe, male, post.

6. Enumerate the prepositions which govern the Ablative. Name three inseparable prepositions and illustrate.

7. Give the Latin for:—In the year nineteen hundred; 30th April; the son of Priam (one word).

8. When is the conjunction *cum* followed by the subjunctive? Give examples.

B.—TRANSLATION AT SIGHT.

1. Si vales, bene est. Constitueramus, ut ad te antea scripseram, obviam Ciceronem Caesari mittere; sed mutavimus consilium, quia de illius adventu nihil audiebamus. De ceteris rebus, etsi nihil erat novi, tamen quid velimus et quid hoc tempore putemus opus esse ex Sicca poteris cognoscere. Tulliam adhuc mecum teneo. Valetudinem tuam cura diligenter. Vale.

2 Damon et Phintias tam fidelem inter se amicitiam iunxerunt, ut, cum alterum ex his Dionysius Syracusanus interficere vellet, atque is tempus ab eo, quo, priusquam periret, domum profectus res suas ordinaret, impetravisset, alter vadem (*bail, security*) se pro reditu eius tyranno dare non dubitavit. Igitur omnes et in primis Dionysius novae atque ancipitis rei exitum speculabantur (*watched*). Approinquante deinde definita die neque illo redeunte, dum unusquisque stultitiae tam temerarium sponsorem damnat, is nihil de amici constantia se metuere praedicabat. Cum autem ad diem alter se recepisset, admiratus amborum animum tyrannus petivit, ut se ad amicitiam tertium ascriberent.

CAESAR AND VIRGIL.

WEDNESDAY, JUNE 13TH:—11.30 TO 1 P.M.

NOTE.—*Candidates for Matriculation may substitute* (*B*) *for* (*A*), *and* (*D*) *for* (*C*).

(A)

(*a*) Ariovistus ad postulata Caesaris pauca respondit, de suis virtutibus multa praedicavit: Non sese Gallis sed Gallos sibi bellum *intulisse;* omnes Galliae civitates ad se oppugnandum venisse ac contra se castra habuisse: eas omnes copias a se uno proelio pulsas ac superatas esse. Amicitiam populi Romani *sibi ornamento* et praesidio non detrimento esse oportere, idque se ea spe petisse. Si per populum Romanum stipendium *remittatur*, non minus libenter sese recusaturum populi Romani amicitiam quam appetierit.

Se prius in Galliam venisse quam populum Romanum. Numquam ante hoc tempus exercitum populi Romani Galliae provinciae fines egressum. Quid sibi *vellet* cur in suas possessiones veniret? Ut ipsi concedi non oporteret, si in nostros fines impetum faceret, sic item nos esse iniquos quod in suo iure se interpellaremus. CAESAR, BK. I.

(*b*) Loci natura erat haec, quem locum nostri *castris* delegerant. Collis ab summo aequaliter declivis ad flumen Sabim, quod supra nominavimus, vergebat. Ab eo flumine pari *adclivitate* collis nascebatur adversus huic et contrarius passus circiter ducentos, *infimus* apertus, ab superiore parte silvestris ut non facile introrsus perspici *posset*. Intra eas silvas hostes in occulto sese continebant: in aperto loco secundum flumen paucae stationes equitum videbantur. Fluminis erat altitudo *pedum* circiter trium.

CAESAR, BK. II.

(B)

Hac *victoria* sublatus Ambiorix statim cum equitatu in Aduatucos, qui erant eius regno finitimi, proficiscitur; neque noctem neque diem intermittit, peditatumque sequi iubet. *Re* demonstrata Aduatucisque concitatis postero die in Nervios pervenit hortaturque ne *sui* in perpetuum *liberandi* atque ulciscendi Romanos pro his quas acceperint iniuriis occasionem dimittant: interfectos esse legatos duos magnamque partem exercitus interisse demonstrat; nihil esse *negotii* subito oppressam legionem quae cum Cicerone *hiemet* interfici; se ad eam rem profitetur adiutorem. Facile hac oratione Nerviis persuadet.

Labienus, cum et loci natura et manu munitissimis *castris* sese teneret, de suo ac legionis periculo nihil timebat: ne quam occasionem rei bene gerendae dimitteret cogitabat. Itaque a Cingetorige atque eius propinquis oratione Induciomari cognita quam in concilio habuerat, nuncio mittit ad finitimas civitates equitesque undique evocat: his certum diem conveniendi dicit. Interim prope quotidie cum omni equitatu Induciomarus sub castris eius vagabatur, alias ut situm castrorum *cognosceret*, alias colloquendi aut territandi causa: equites pleramque omnes tela intra vallum coniiciebant. Labienus suos intra munitionem continebat timorisque opinionem quibuscumque poterat rebus augebat.

CAESAR, Bk. V.

Give the grammatical construction of words printed in italics.

(C)

Ac primum *silici* scintillam excudit Achates,
Suscepitque ignem foliis, atque arida *circum*
Nutrimenta dedit, rapuitque in fomite flammam.
Tum Cererem corruptam undis Cerealiaque arma
Expediunt, fessi *rerum*; frugesque receptas

Et torrere parant flammis et frangere saxo.
Cum venit, aulaeis iam se regina superbis
Aurea composuit sponda, mediamque locavit:
Iam pater Aeneas, et iam Troiana iuventus
Conveniunt, stratoque super discumbitur ostro.
Dant famuli manibus lymphas, Cereremque canistris
Expediunt, tonsisque ferunt mantelia villis.
Quinquaginta intus famulae, *quibus* ordine longo
Cura *penum* struere, et flammis adolere penates.

VIRGIL, BK. I.

2. Explain the grammatical construction of words printed in italics.

3. Scan the first three lines of the first extract from Virgil.

(D)

At domus interior gemitu miseroque tumultu
miscetur; penitusque cavae plangoribus aedes
femineis ululant; ferit aurea sidera clamor.
Tum pavidae tectis matres ingentibus errant,
amplexaeque tenent postes, atque oscula figunt.
Instat vi patria Pyrrhus; nec claustra, neque ipsi
custodes sufferre valent. Labat ariete crebro
ianua, et emoti procumbunt cardine postes.
Fit via vi: rumpunt aditus, primosque trucidant
immissi Danai, et late loca milite complent.
Non sic, aggeribus ruris cum spumeus amnis
exiit, oppositasque evicit gurgite moles,
fertur in arva furens cumulo, camposque per omnis
cum stabulis armenta trahit.—VIRGIL, AEN. II.

(*a*) Give the principal parts of:—*miscetur, ferit, figunt, rumpunt, trahit*.

(*b*) Account for the case of *tectis, vi, aggeribus, cumulo*.

GREEK.

XENOPHON, ANABASIS BOOK I.

FRIDAY, JUNE 15TH:—MORNING, 9 TO 10.30.

1. Translate with brief explanation of the constructions underlined:—

(*a*) Ἀρίστιππος δὲ ὁ Θετταλὸς ξένος ὢν ἐτύγχανεν αὐτῷ, καὶ πιεζόμενος ὑπὸ τῶν οἴκοι ἀντιστασιωτῶν ἔρχεται

πρὸς τὸν Κῦρον καὶ αἰτεῖ αὐτὸν εἰς δισχιλίους ξένους καὶ τριῶν μηνῶν μισθόν, ὡς οὕτως περιγενόμενος ἂν τῶν ἀντιστασιωτῶν·

(*b*) Τισσαφέρνης δὲ [κατανοήσας ταῦτα, ¨καὶ μείζονα ἡγησάμενος ¨εἶναι ἢ ὡς ἐπὶ Πισίδας τὴν παρασκευήν, πορεύεται ὡς βασιλέα ᾗ ἐδύνατο [τάχιστα ἱππέας ἔχων ὡς πεντακοσίους.

(*c*) Κλέαρχος δὲ τότε μὲν μικρὸν ἐξέφυγε μὴ καταπετρωθῆναι. ὕστερον δὲ ἐπεὶ ἔγνω ὅτι οὐ δυνήσεται βιάσασθαι, συνήγαγεν ἐκκλησίαν τῶν αὑτοῦ στρατιωτῶν.

(*d*) ἢν γὰρ ψηφίσωνται ἕπεσθαι, ὑμεῖς δόξετε αἴτιοι εἶναι ἄρξαντες τοῦ διαβαίνειν, καὶ ὡς προθυμοτάτοις οὖσιν ὑμῖν χάριν εἴσεται Κῦρος καὶ ἀποδώσει· ἐπίστατο δὲ εἴ τις καὶ ἄλλος.

(*e*) τὸ δὲ σύμπαν δῆλος ἦν Κῦρος ὡς σπεύδων πᾶσαν τὴν ὁδὸν καὶ οὐ διατρίβων ὅπου μὴ ἐπισιτισμοῦ ἕνεκα ἤ τινος ἄλλου ἀναγκαίου ἐκαθέζετο, νομίζων, ὅσῳ μὲν θᾶττον ἔλθοι, τοσούτῳ ἀπαρασκευοτέρῳ βασιλεῖ μαχεῖσθαι, ὅσῳ δὲ σχολαίτερον, τοσούτῳ πλέον συναγείρεσθαι βασιλεῖ στράτευμα.

(*f*) μετὰ ταῦτα, ἔφη, κελεύοντος Κύρου ἔλαβον τῆς ζωνῆς τὸν Ὀρόνταν ἐπὶ θανάτῳ ἅπαντες ἀναστάντες καὶ οἱ συγγενεῖς· εἶτα δὲ ἐξ ἧγὸν αὐτὸν οἷς προσετάχθη.

(*g*) ταῦτα δὲ ἤγελλον πρὸς Κῦρον οἱ αὐτομολήσαντες ἐκ τῶν πολεμίων παρὰ μεγαλοῦ βασιλέως πρὸ τῆς μάχης καὶ μετὰ τὴν μάχην οἳ ὕστερον ἐλήφθησαν τῶν πολεμίων ταὐτὰ ἤγγελλον.

(*h*) πρὸ δὲ αὐτῶν ἅρματα διαλείποντα συχνὸν ἀπ' ἀλλήλων τὰ δὴ δρεπανηφόρα καλούμενα· εἶχον δὲ τὰ δρέπανα ἐκ τῶν ἀξόνων εἰς πλάγιον ἀποτεταμένα καὶ ὑπὸ τοῖς δίφροις εἰς γῆν βλέποντα, ὡς διακόπτειν ὅτῳ ἐντυγχάνοειν.

(*i*) καὶ γὰρ αὐτὸ τοῦτο οὗπερ αὐτὸς ἕνεκα φιλῶν ᾤετο δεῖσθαι, ὡς συνεργοὺς ἔχοι, καὶ αὐτὸς ἐπειρᾶτο συνεργὸς τοῖς φίλοις κράτιστος εἶναι τούτου ὅτου αἰσθάνοιτο ἕκαστον ἐπιθυμοῦντα.

(*k*) ἐν ᾧ δὲ ταῦτα ἐβουλεύοντο, καὶ δὴ βασιλεὺς παραμειψάμενος εἰς τὸ αὐτὸ σχῆμα κατέστησεν ἀντίαν τὴν φάλαγγα ὥσπερ τὸ πρῶτον μαχούμενος συνήει. ὡς δὲ εἶδον οἱ Ἕλληνες ἐγγύς τε ὄντας καὶ παρατεταγμένους, αὖθις παιανίσαντες ἐπῆσαν πολὺ ἔτι προθυμότερον ἢ τὸ πρόσθεν.

2. In the above extracts parse the following words:—
μηνῶν, ἱππέας, ἔγνω, εἴσεται, θᾶττον, ἀναστάντες, ἐλήφθησαν, ἀποτεταμένα, ᾤετο, συνήει.

3. Explain the expressions (*a*) τὰ Λύκαια ἔθυσε, (*b*) κῶμαι εἰς ζώνην δεδομέναι. (*c*) κατὰ χώραν ἔθεντο τὰ ὅπλα. (*d*) ἀμφὶ ἀγορὰν πλήθουσαν. (*e*) δῶρα πλεῖστα εἴς γε ἀνὴρ ἐλάμβανε.

4. Explain briefly the causes that led to the Anabasis.

or

Draw a plan showing in detail the positions of the opposing forces at the battle of Cunaxa.

GREEK GRAMMAR AND COMPOSITION.

FRIDAY, JUNE 15TH:—MORNING, 10.30 TO 1.

I.

Translate into Greek:—

(*a*) The children ran through the gates to see the king arriving at the river.

(*b*) Soldiers wish to obey the bravest leader.

(*c*) After this the queen gave the same gifts to Xenophon and the rest of the cavalry.

(*d*) They marched three days into the desert and on the fourth encamped to await the evening.

(*e*) Thereupon he sent for Cyrus wishing to deceive him, but he said he would not leave the army behind.

(*f*) When they had ceased from the war they remained in the city and later attacked the citizens themselves.

II.

Translate into English :

τούτων λεχθέντων ἀνέστησαν, καὶ ἀπελθόντες κατέκαιον τὰς ἁμάξας καὶ τὰς σκηνάς· τῶν δὲ περιττῶν, ὅτου μὲν δέοιτο τις, μετεδίδοσαν ἀλλήλοις, τὰ δὲ ἄλλα εἰς τὸ πῦρ ἐρρίπτουν. ταῦτα ποιήσαντες ἠριστοποιοῦντο. ἀριστοποιουμένων δὲ αὐτῶν ἔρχεται Μιθριδάτης σὺν ἱππεῦσιν ὡς τριάκοντα, καὶ καλεσάμενος τοὺς στρατηγοὺς εἰς ἐπήκοον, λέγει ὧδε. Ἐγώ, ὦ ἄνδρες Ἕλληνες, καὶ Κύρῳ πιστὸς ἦν, ὡς ὑμεῖς ἐπίστασθε, καὶ νῦν ὑμῖν εὔνους· καὶ ἐνθάδε εἰμὶ σὺν πολλῷ φόβῳ διάγων. εἰ οὖν ὁρῴην ὑμᾶς σωτήριόν τι βουλευομένους, ἔλθοιμι ἂν πρὸς ὑμᾶς, καὶ τοὺς θεράποντας πάντας ἔχων.

III.

(*a*) Give Genit. Sing., Acc. Plur., Dat. Plur., and Gender of

νῆσος, νοῦς, ἐλπίς, ἀνήρ, θρίξ.

(*b*) Give comparative and superlative of

μέγας, κακός, εὐδαίμων, πένης, μέλας.

(*c*) Give 3rd sing. pres. subj. mid., 2nd sing. aor. opt. act., 2nd sing. pres. imperat. act.; 1st aor. part. pass. acc. masc. fem. and neut. of :—

δηλόω, πείθω, ἀγγέλλω, τίθημι, πράττω, κρύπτω.

3rd sing. aor. ind. act., 3rd plur. perf. subj. pass., 2nd plur. aor. imper. pass., 3d plur. impf. indic. mid, of ἵημι, δέω (bind), δέω (need), κελεύω, φαίνω, νικάω.

(*d*) Give the Greek for seventeenth, fifth, nine, a hundred times, seventieth, ten thousand three hundred and forty-two, once.

(*e*) Give principal parts of
δείκνυμι, τυγχάνω, πυνθάνομαι, τέμνω, φεύγω.

FRENCH.

A

1. Translate into English :

(*a*) Ne pas *faire* à autrui ce que nous ne *voudrions* pas qu'on nous fit, voilà la justice.

Faire pour autrui en toute rencontre, ce que nous voudrions qu'il fit pour nous, voilà la charité.

Un homme *vivait* de son travail, lui, sa femme et ses petits enfants ; et comme il avait une bonne santé, des bras robustes, et qu'il trouvait aisément à s'employer, il *pouvait* sans trop de peine *pourvoir* à sa subsistance et à celle des siens.

Mais il arriva qu'une grande gêne étant *survenue* dans le pays, le travail y fut moins demandé, parce qu'il *n'offrait* plus de bénéfices à ceux qui le payaient, et en même temps le prix des choses nécessaires à la vie augmenta.

Cet homme et sa famille *commencèrent* donc à *souffrir* beaucoup. Après avoir bientôt épuisé ses modiques épargnes, il lui *fallut* vendre pièce à pièce ses meubles d'abord, puis quelques-uns de ses vêtements; et, quand il se fut ainsi dépouillé, il demeura privé de toutes ressources, face à face avec la faim. Et la faim n'était pas entrée seule chez lui : la maladie y était aussi entrée avec elle.

2. Translate into French :—

(*a*) My dear Charles,

I arrived in Montreal this morning by the Canadian Pacific. I have not yet found a room, but I have been told that I can get one on Mansfield street for ten dollars a month. I am writing this at my cousin's, with whom I am to dine at half past six. When you come to Montreal, do not forget to pay me a visit. I intend to give the most of my time to study but I should be sorry to think that a student could not devote (*consacrer*) an afternoon to a friend.

(*b*) Give it to him ; I give it to you ; The songs I have heard sung ; You must sing ; Hurry ; Come and see me ; Let him come ; I am called John ; The best wine that ever was sold ; If youth knew, if old age could.

B

3. Write the five principal parts (primitive tenses) of the verbs in italics in 1 (*a*).

4. When is *some* or *any* rendered into French by *de* only ? Give examples.

5. What is the position of adverbs in a French sentence? Embody the following adverbs in short sentences ; firstly with a simple tense ; secondly with a compound tense :—*beaucoup, toujours, hier.*

6. Write the plural :—*Le monsieur que j'ai vu est celui qui est venu il y a une heure.*

7. Explain the use of the Imperfect, Past Definite and the Past Indefinite in French. Form sentences to illustrate your answer.

C

8. Reproduce in French (about 100 words) the accompanying story to be read aloud by the examiner.

The following story is to be read to the candidates half an hour before the close of the examination. It must be read twice slowly and deliberately in order that the candidates may grasp its meaning. Candidates will then reproduce the story in French, in the same answer book as part B. While the story is being read all pens must be laid on the desks.

THE FAR-SIGHTED DERVISE.

C

A dervise was journeying alone in a desert, when two merchants suddenly met him : "You have lost a camel," said he to the merchants. "Indeed we have," they replied. "Was he not blind in his right eye, and lame in his left leg?" said the dervise. "He was," replied the merchants. "Had he not lost a front tooth ?" said the dervise. "He had," rejoined the merchants. "And was he not loaded with honey on one side, and wheat on the other?" "Certainly," they replied ; "and as you have seen him so lately, you can in all probability conduct us to him." "My friends," said the dervise, "I have never seen your camel, nor ever heard of him, but from you."

"A pretty story, truly," said the merchants : "but where are the jewels which formed a part of his cargo ?" "I have neither seen your camel nor your jewels," repeated the dervise. On this they seized him and hurried him before the judge, where nothing could be found against him. They

then were about to punish him as a sorcerer, when the dervise with great calmness said:

"I have lived long in a desert. I knew that I had crossed the track of a camel that had strayed from its owner, because I saw no mark of any human footstep on the same route; I knew that the animal was blind in one eye, because it had cropped the grass only on one side of its path; and I perceived that it was lame in one leg from the faint impression which that particular foot had produced upon the sand; I concluded that the animal had lost one tooth, because wherever it had grazed a small tuft of grass had been left uninjured in the centre of its bite. As to the burden of the beast, the busy ants informed me that it was corn on one side, and the flies that it was honey on the other."

GERMAN.

THURSDAY, JUNE 14TH:—2 TO 4 P.M.

1. Translate any two of the following extracts:

(*a*) „Ein Esel," rief er aus, „wer diesen Quark verschlucket!
Gewiß, die Mutter hat mich nur geneckt.
Ich schenk' ihr meinen Teil an ihrem Göttermahle.
Allein laß sehn, was weiter unten steckt."
Er räumt die Hülse weg und kommt nun auf die Schale.
„Was ist denn das? Verflucht! ein Kieselstein.
Hoho! zum dritten Mal will ich der Narr nicht sein.
Fort mit der dummen Frucht!" Sie flog in einen Graben.
Die Mutter, die kein Wort vom Selbstgespräch verlor,
Sprang nun aus einem Busch hervor.
„Du zürnst umsonst," sprach sie zum naseweisen Knaben
Und brach den Kiesel auf. „An dir liegt nur die Schuld:
Ein wenig Arbeit mehr, ein wenig mehr Geduld,
So würdest du den Kern gefunden haben."

Pfeffel.

(*b*) Sonntagsstille lag auf Flur und Wald, und die an der Berghalde zerstreuten Hütten waren wie ausgestorben. Hier und da lag vor einer Thür ein schläfriger Hund, der nur dann seine Mittagsruhe unterbrach, wenn ihm eine summende Fliege allzusehr zusetzte. Dann that der Gepeinigte einen Schnapp nach der Friedenstörerin, um im nächsten Augenblick die müden Lider wieder zu schliessen.

Aus dem Dorf klang lustiges Gefiedel, und das tiefe Brummen der Bassgeige; dazwischen ward Geräusch fallender Kegel vernehmbar, und der Ruf des Kegeljungen, zuweilen auch der Jauchzer eines übermütigen Burschen, oder das Kreischen einer geängstigten Dirne.

(*c*) Weil der Tag kühl war, so proponierte Herr Eckart, in den inneren Räumen der „Ressource" gemeinschaftlich eine Flasche Roten zur Erwärmung zu trinken. Das war dem Kanzleirat, wie er sagte, aus der Seele gesprochen. Die Flasche ward in einem kleinen, abgelegenen Zimmer ausgestochen, und es wurde dabei ziemlich laut gesprochen, mit den Kelchen angestoßen und auch ein Glas verschüttet, was nach der Ansicht aller Vernünftigen Gutes bedeutet.

Spät am Abend wanderten die beiden Herren unter lebhaften Gesprächen Arm in Arm nach der Stadt, und Herr Eckart ließ es sich nicht nehmen, den Kanzleirat bis an dessen Behausung zu begleiten.

Die Kanzleirätin, die in einer weißen Haube nach ihrem lüderlichen Ehegespons auslugte, fuhr schnell mit dem Kopf zurück, als das Paar auf das Haus zugesteuert kam.

2. Write the inf. and past part. of:—*rief, flog, sprach, verlor, unterbrach, zusetzte, that;* and the past tense of:—*schliessen, fallend, lass, kommt.*

3. Express in German:—Of my dear daughters; these Germans; Berlin books; those lovely yellow flowers; some new pens; a few bright days every winter.

4. What is the difference between *Ich kenne den Weg* and *Ich weiss den Weg?*

5. Change to the passive form the following:
Der Mann schlägt seinen Hund; Er gab mir ein Buch; Man wird mir vergeben.

6. Translate into German:—

(*a*) My father has given me a large and expensive German Dictionary, the best he could get in Montreal. The more I use it, the better I like it.

(*b*) If you see my cousin, please tell him that we have been waiting for him for two hours. He ought to have been here when I arrived, as I had written to him and told him at what hour in the evening our train left Boston.

(*c*) Yesterday we should have had more pleasure, if we had had more time.

(*d*) I could have sold my horse yesterday, but I did not want to.

(*e*) The concert will begin at eight o'clock; we thought it had already begun.

(*f*) An old man who emigrated (*auswandern*) to America in his youth, married there, brought up a large family and returned in his seventieth year to Germany.

N.B.—Candidates from the Provinces of Ontario and Nova Scotia may substitute the following for question 1 (*a*), (*b*) *and* (*c*).

Translate into English :—

(*a*) „Gut," erwiderte das Männlein, wenn Du nicht anders willst, so kannst Du es haben; meine Axt habe ich bei der Hand." Er nahm ganz ruhig sein Pfeiflein aus dem Mund, klopfte es aus und steckte es ein. Dann stand er langsam auf und ging hinter die Tannen. Peter aber setzte sich weinend ins Gras, sein Leben war ihm nichts mehr, und er erwartete geduldig den Todesstreich. Nach einiger Zeit hörte er leise Tritte hinter sich und dachte: „Jetzt wird er kommen."

„Schau Dich doch einmal um, Peter Munk!" rief das Männlein. Er wischte sich die Thränen aus den Augen und schaute sich um und sah—seine Mutter und Lisbeth, seine Frau, die ihn freundlich anblickten. Da sprang er freudig auf:

„So bist Du nicht tot, Lisbeth? Und auch Ihr seid da Mutter und habt mir vergeben?"

(*b*) „So sprach der arglistige Michel, und die andern waren es zufrieden; die einen, weil sie gerne nach Holland gezogen wären, es zu sehen, die andern des Geldes wegen. Nur ein einziger war redlich und mahnte sie ab, das Gut ihres Herrn der Gefahr auszusetzen oder ihn um den höheren Preis zu betrügen; aber sie hörten nicht auf ihn und vergaßen seine Worte, aber der Holländer-Michel vergaß sie nicht. Sie fuhren auch mit dem Holz den Rhein hinab, Michel leitete den Floß und brachte sie schnell bis nach Rotterdam. Dort bot man ihnen das Vierfache von dem früheren Preis; und besonders die ungeheueren Balken des Michel wurden mit schwerem Geld gezahlt.

ARITHMETIC.

MONDAY, JUNE 18TH :—MORNING, 10.30 TO 12.

1. Find the value of

$$\frac{9.\dot{6}}{3.3} \times \frac{14.02\dot{3}}{.9} \times 1\frac{1}{29} \times .\dot{3} \times 1.7\dot{4}\dot{1} \div .\dot{0}0\dot{6} \times \frac{30}{4207}$$

2. A round stone pillar 10 ft high weighs 20 tons. Find its diameter, assuming that the stone weighs 192.32 lbs. per cubic ft.

3. Find cubic contents of a triangular prism, the sides of the base being 4 ft., 13 ft. and 15 ft. respectively, and the height 14 ft.

4. With aid of logarithms, prove

$$(451)^{\frac{3}{5}} \times (231)^{\frac{4}{3}} = 55460$$

5. Two notes, each due in 3 years, the aggregate face value of which is $1,000, are discounted, one at 4 % bank discount, the other at 4 % true discount; the sum of the proceeds of the two notes is $887.20. What is the face value of each?

6. A merchant buys 50 pieces of goods in Paris at 250 francs a piece, exchange being at 5.15; the duty is 50 % of the price and the expenses of shipping are $75. For how much must he sell each piece to gain 25 %?

GEOMETRY.

TUESDAY, JUNE 12—AFTERNOON, 2 TO 4.

1. Define clearly :—quadrilateral, trapezium, parallelogram, rhombus, rectangle, square.

2. The three angles of a triangle are equal to two right angles.

(*a*) The interior angles of any rectilinear figure together with four right angles are equal to twice as many right angles as the figure has sides.

3. The square upon the hypotenense of a right angled triangle is equal to the sum of the squares upon the sides.

(*a*) Show how to find the side of a square whose area is three times that of a given square.

4. If a straight line be bisected and also divided unequally, the rectangle contained by the unequal segments together with the square upon the line between the points of section is equal to the square upon half the line.

State the corresponding proposition when the line is divided externally.

5. To draw a tangent to a circle.

(*a*) Find the locus of the centres of all circles which touch a given straight line at a given point.

6. If two chords of a circle cut one another, the rectangle contained by the segments of the one shall be equal to the rectangle contained by the segments of the other.

If through E, a point without a circle, two secants EAB and ECD are drawn : shew that the rectangle EA, EB is equal to the rectangle EC, ED.

7. Prove that the lines drawn from the angles of a triangle to the middle points of the opposite sides meet in one point.

ALGEBRA.

MONDAY, JUNE 11TH :—AFTERNOON, 2 TO 3.30.

1. Reduce to the simplest form :

(*a*) $$\frac{x^2 - y^2}{x^2 - 3xy + 2y^2} \times \frac{xy - 2y^2}{x^2 + xy} \times \frac{x^2 - xy}{x - y)^2}$$

(*b*) $$\frac{3 + \sqrt{6}}{5\sqrt{3} + \sqrt{50} - 2\sqrt{12} - \sqrt{32}}$$

2. Find the square of $x^{\frac{3}{2}} - 2xy^{-\frac{1}{2}} + \frac{1}{2}y^{\frac{1}{2}}$, and extract the square root of $9a^2 + 4b^2 + 16c^2 - 12ab + 24ac - 16bc$.

3. Solve

(*a*) $$\frac{x - 7}{x - 7} = \frac{2x - 15}{2x - 6} - \frac{1}{2(x + 7)}$$

(*b*) $$\sqrt{9 + 2x} - \sqrt{2x} = \frac{5}{\sqrt{9 + 2x}}$$

4. The middle digit of a number between 100 and 1,000 is zero, and the sum of the other digits is 10. If the digits be reversed, the

number so formed exceeds the original number by 198. Find the number.

5. Solve

(*a*) $\frac{x}{2} - 1 = \frac{y}{6} + 1 = \frac{z}{7} + 2$, and $\frac{y}{3} + \frac{z}{2} = 13$.

(*b*) $x^2 - \frac{4}{5}x = 21$.

6. A lawn, 50 feet long by 24 feet wide, is surrounded by a path of uniform width. If the area of the path be equal to that of the lawn, find its width.

TRIGONOMETRY.

TUESDAY, JUNE 12TH:—AFTERNOON, 4 TO 5.30.

1. Define a radian (unit of circular measure) and prove that the number of radians in any angle at the centre of a circle is equal to the length of the arc on which the angle stands divided by the radius of the circle.

2. Trace the changes in the sign and value of the tangent as the angle increases from 0° to 360°.

3. Express $\cos\theta$, $\tan\theta$ and $\sec\theta$ in terms of $\sin\theta$ and shew that

$$\sec\theta - \tan\theta . \sin\theta = \cos\theta.$$

4. If $\beta = 30°$, $\gamma = 45°$, and $\delta = 60°$

prove $(\sin\delta - \sin\gamma)(\cos\beta + \cos\gamma) = \sin^2\beta$.

A tower on the bank of a river is 120 ft. high, the angle of elevation of the top of the tower from the opposite bank is 20°. Find the breadth of the river if $\tan 20° = .35$.

5. Prove $\cos(A + B) = \cos A, \cos B - \sin A, \sin B.$

$\cos(A - B) = \cos A, \cos B + \sin A, \sin B.$

6. Prove,

(1) $\sin A + \sin B = 2 \sin \frac{A + B}{2} \cos \frac{A - B}{2}$.

(2) $\cos(A - B) + \sin(A + B) = 2 \sin(A + 45°).\cos(B - 45°$.

(3) $\tan 75° = 2 + \sqrt{3}$.

(4) $1 + \tan\alpha \tan\beta = \frac{\cos(\alpha - \beta)}{\cos\alpha \cos\beta}$.

(5) $\frac{\sin(\alpha + \beta)}{\sin\alpha + \sin\beta} = \frac{\cos\frac{\alpha + \beta}{2}}{\cos\frac{\alpha - \beta}{2}}$.

ENGLISH LANGUAGE.

TUESDAY, JUNE 19TH :—MORNING, 10.30 TO 12.30.

1. State what Trench says about the origin of language.

2. Show the poetry contained in the following words by giving their derivation and making a short note on each : (*a*) tribulation, (*b*) desultory, (*c*) halcyon.

Show how some words have degenerated by giving the past meaning and present meaning of (*a*) boor, (*b*) officious.

3. Point out facts of history shown by the following words: (*a*) sceptre, (*b*) home, (*c*) algebra, (*d*) monastery, (*e*) dunce.

What two words in our language lead us to believe that Christianity was first introduced into towns? Write briefly on the deductions we may draw therefrom.

4. Give the meaning and derivation of five words derived from proper names.

5. (*a*) Define synonyms according to Trench ; (*b*) make a short note on the origin of synonyms.

(*c*) Distinguish between interference and interposition ;

(*d*) between genuine and authentic ;

(*e*) between felicitate and congratulate.

6. How did the Latin element in our language find its way there?

7. Name with precision the forms of the verb which can be used as nouns and adjectives, and give in a short sentence an illustration of the use of each.

8. (*a*) State what is denoted by the following suffixes :—*oon*,—*or* —*ess*,—*dom*,—*ster*,—*ness*,—*ful*,—*ish*,—*en*,—*trix* and give examples.

(*b*) State what is denoted by the following prefixes :

a (English), *b* (Latin), *vice*. Give examples.

9. Make a note on the italicized inflexions in stab*s*, new*s*, die*s*, needs, (adverb), seld*om*.

Correct or justify, giving reasons ;

(*a*) Two and two is four.

(*b*) James says he don't like work.

(*c*) Who is there? Me.

(*d*) I said that I will try again.

10. Analyze :—

(*a*) " Here Ouse, slow winding through a level plain
Of spacious meads with cattle sprinkled o'er,
Conducts the eye along his sinuous course
Delighted."

(*b*) In the colony of Canada where we live, he acts as if trade were increasing.

ENGLISH LITERATURE.

THURSDAY, JUNE 14:—MORNING, 9 TO 10.30.

Candidates for Matriculation only, will answer TWO *groups, namely, A or B ; C.*]

A.—SCOTT.

1. Explain the use and describe the passage of the Fiery Cross.

2. Make notes on the following words:—Glaive, targe, bourne, mewed, jennet, beaker, Morrice-dancer, clarion, linn, worth (in woe *worth* the day).

3. Refer the following to their proper places in the poem :

(*a*) In vain the learning of the age
Unclasped the sable-lettered page.

(*b*) Forgive, be generous, and depart.

(*c*) King James shall mark
If age has tamed these sinews stark.

(*d*) 'Twere worth ten years of peaceful life,
One glance at their array ;

(*e*) I wish I were as I have been
Hunting the hart in forest green.

B.—TENNYSON.

1. Give in your own words an outline of "A Dream of Fair Women" or "The Morte D'Arthur."

2. Make an outline sketch of "The Revenge," stating clearly the historic ground work of the story.

3. State in what poem each of the following occurs, and give some idea of the context :

(*a*) And at their feet the crocus brake like fire.

(*b*) And they crossed themselves for fear.

(*c*) Let us swear an oath and keep it with an equal mind.

(*d*) A gentle sound, an awful light!

(*e*) And let the mournful, martial music blow.

C.—SHAKESPERE.

1. Give in your own words, with occasional quotations, the substance of Act II., sc. 1, Rich. II. (the death of Gaunt, etc.)

2. By whom and in what circumstances were the following lines spoken?

(*a*) Rouse up thy youthful blood, be valiant and live.

(*b*) A brittle glory shineth in this face.

(*c*) Ten thousand bloody crowns of mothers' sons
Shall ill become the flower of England's face.

(*d*) But Heaven hath a hand in these events
To whose high will we bound our calm contents.

(*e*) Thy overflow of good converts to bad.

3. Make short explanatory notes on:

Mowbray's *waxen* coalt, pelting farm, rug-headed kerns, glistering Phaethon, Jack o' the clock.

D.—STOPFORD BROOKE.

1. Write a paragraph on each of the following:
Cynewulf, Lydgate, Marlowe and Chatterton.

2. Write what you know of the life and works of Milton.

3. Characterize briefly the poetry of Byron, of Shelley and of Coleridge, illustrating your remarks by reference to particular poems.

ENGLISH LITERATURE.

THURSDAY, JUNE 14TH:—MORNING, 9 TO 10.30.

(*For Ontario candidates.*)

LONGFELLOW AND WORDSWORTH.

1. Write a brief outline of Evangeline, and add your own opinion as to the plausibility and beauty of the story.

2. Make notes on *Sunshine of Ste. Eulalie, Beau Séjour, Loup-garou, Fata Morgana, Mowis.*

3. Paraphrase "Excelsior," and quote one stanza.

4. Write a short criticism of the sonnets of Wordsworth, illustrating by references to particular sonnets.

5. Quote one sonnet in full, or twelve lines from any other poem of Wordsworth's which you have studied.

6. Compare the poetry of Longfellow with that of Wordsworth.

7. In what poems do the following lines occur:

(*a*) He did not pause to parley or dissemble.

(*b*) Hail to thee, far above the rest.
In joy of voice and pinion

(*c*) But now alas the place seems changed,
Thou art no longer here.

(*d*) Thou bringest unto me a tale
Of visionary hours

(*e*) Sweet silent creature.

"GREAT EVENTS OF HISTORY."

TUESDAY, JUNE 19TH:—MORNING, 9 TO 10.30.

1. Sketch the career of Constantine the Great.

2. (*a*) What do you understand by the expression, "Holy Roman Empire?"

(*b*) Give an account of the Saxon emperors.

3. Trace the process of Moorish expulsion from Spain.

4. With what great events do you connect the name of Richelieu

5. Describe the part of Frederick the Great in the Seven Years' War.

6. Make brief, clear notes on: Abu Beker, Wittikind, Treaty of Verdun, Council of Clermont, Janissaries, Augsburg Confession, Lützen, the Directory, Wagram, Treaty of Berlin.

GREEK AND ROMAN HISTORY.

TUESDAY, JUNE 19TH:—MORNING, 9 TO 10.30.

I.

1. (*a*) Describe the institutions of Sparta.

(*b*) Name the other states of the Peloponnesus, and comment upon the relations between each of them and Sparta.

2. Outline the chief events of Greek history from the Peace of Antalcidas to the battle of Chaeronea.

3. Write short, clear notes on: Amphictyony, Areopagus, Cleomenes, Mycale, Pausanias, Peace of Nicias, Mantinea, Phalanx, Seleucidae, Achaean League.

II.

4. Trace in detail the course of the war between Rome and
(*a*) the Gauls,
(*b*) the Latins,
(*c*) the Samnites.

5. Outline the chief events of Roman history from the rise of Marius to that of Julius Cæsar.

6. Make short, clear notes on: Tarquinius Priscus, the Censors, Veii, Regulus, Lake Trasimenus, Tiberius Gracchus, Philippi, the Emperor Tiberius, Praetorian Guard, Colosseum.

PHYSICAL GEOGRAPHY.

THURSDAY, JUNE 14TH:—AFTERNOON, 4 TO 5.30.

1. Give proofs that the earth is round, and explain why it is slightly flattened at the poles.

2. Draw a map of Europe, indicating its system of river drainage.

3. Show by map (or otherwise) the physical conformation of Africa, paying special attention to Cape Colony, the Orange Free State and the Transvaal.

4. "There is a river in the ocean." Name it, give its course, its cause and its effects.

DATE DUE

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ILL ML	NOV 3 1984
FEB 15 1985	
	FEB 14 1985
MAR 5 1989	
	MAR 10 1985

KING PRESS NO. 306

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